Building a strong ICRISAT

Annual Report 2003

King Baudouin Award:

30 Years

BUILDING A STRONG ICRISAT
FOR A FOOD-SECURE SAT

Awards

King Baudouin Award: *an ICRISAT hat trick!*

When the Consultative Group on International Agricultural Research (CGIAR) was awarded a development award by Belgium in 1980, it invested the prize money in a biennial award recognizing outstanding research by the CGIAR centers. The winning centers are selected by the Science Council (formerly the Technical Advisory Committee) of the CGIAR.

ICRISAT first won the award in 1996 for its work on pearl millet, and again in 1998 for research on pigeonpea – the first time any center had won it twice in a row. ICRISAT won it *again* in 2002, this time with its partner ICARDA, for excellence in chickpea research, thus completing the hat trick!

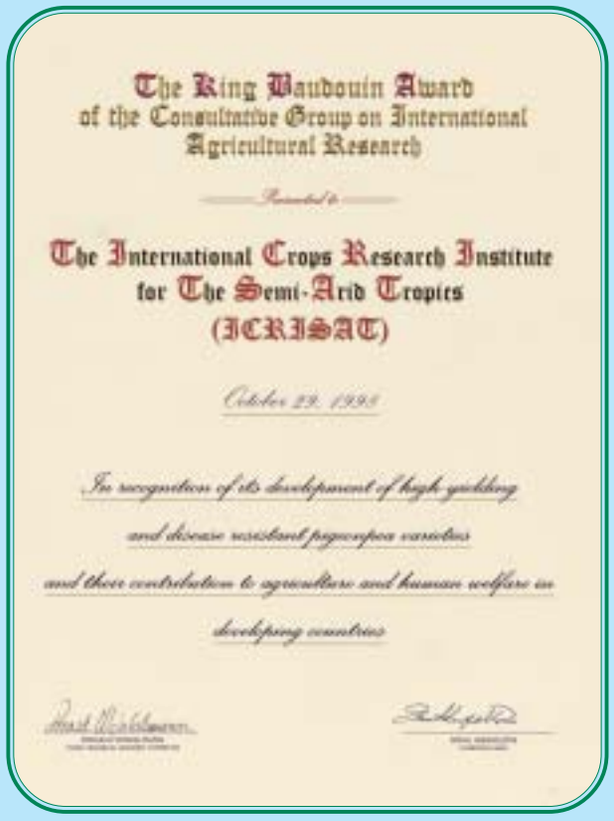

The King Baudouin Award
of the Consultative Group on
International Agricultural Research

Presented to

The International Crops
Research Institute
for the Semi-Arid Tropics—ICRISAT

October 21, 1996

To recognize outstanding achievement
in the development of disease-resistant,
yield-increasing pearl millet
in collaboration with advanced institutions
and national research programs


The King Baudouin Award
of the Consultative Group on International
Agricultural Research

Presented to

The International Crops Research Institute
for The Semi-Arid Tropics
(ICRISAT)

October 29, 1998

In recognition of its development of high-yielding
and disease-resistant pigeonpea varieties
and their contribution to agriculture and human welfare in
developing countries


The King Baudouin Award
of the Consultative Group on
International Agricultural Research (CGIAR)

Presented to

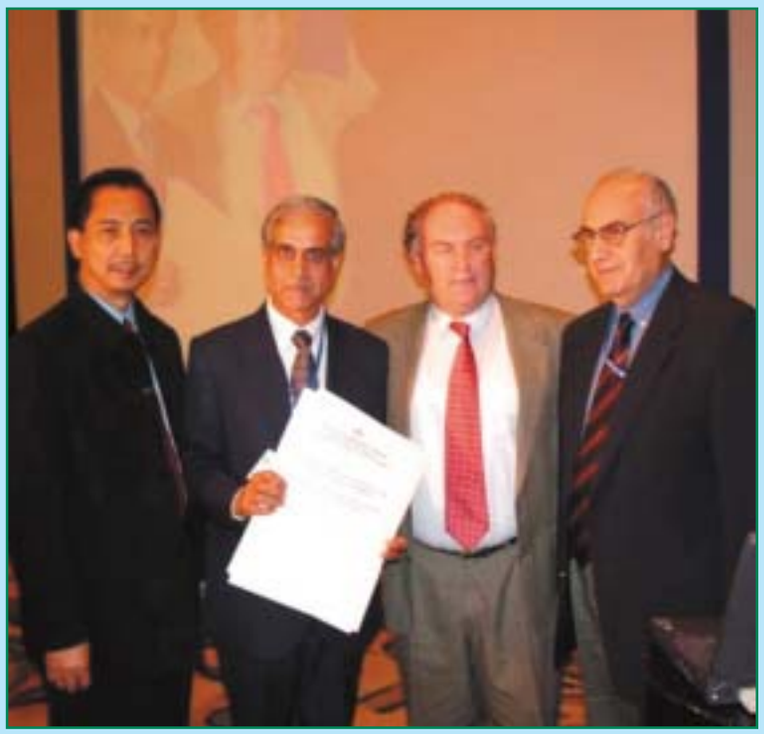
International Crops Research Institute for the
Semi-Arid Tropics (ICRISAT)
and
International Center for Agricultural Research
in the Dry Areas (ICARDA)

for

"Changing Lives in Marginal Environments
A Partnership in Chickpea Research"

1996: *ICRISAT Director General James G Ryan receiving the King Baudouin Award from Don Winkelmann, Chair, Technical Advisory Committee.*

1998: *ICRISAT Director General Shawki Barghouti receiving the award from CGIAR Chairman Ismail Serageldin.*



2002: *ICRISAT's William Dar (left) and ICARDA's Adel El-Beltagy (right), Directors General of the winning centers, along with ICRISAT's Jagdish Kumar, accepting the award from CGIAR Chairman Ian Johnson.*

Contents

2 Message from the Chairman

3 Message from the Director General

Research for Impact

4 Subsistence farming to the dust bin

6 Rebuilding Afghanistan's agriculture

8 Seeds of Life

10 A new Sahel – sun, sand and salvation

12 Yellow gold in Myanmar

14 Old crops, new horizons

16 Groundnut for West Africa

18 Birds of a feather

20 Publications

Partnerships

33 Development Investor Partnerships: Targeted Projects

41 Research Scholars

43 Workshops, Conferences and Training Courses

About ICRISAT

51 SATrends

52 ICRISAT in the News

54 Governing Board

56 Senior Staff

58 Financial Summary

60 ICRISAT on the Web

Message from the Chairman

It has been a year of major accomplishments. As the leader of Team ICRISAT, I pay deep homage to my predecessors who played no small part in laying a solid foundation for the successes that ICRISAT now enjoys. In addition to winning its third King Baudouin Award, ICRISAT successfully went through two external reviews.

The full reports of both panels have been received, and we have responded to their recommendations. Some highlights from the reports:

- ICRISAT has continued its excellence in science with good programs in genetic resources, crop improvement, and biotechnology.
- More than ever, ICRISAT deserves the continuing and enhanced support by the donor community as it charts new ground for the future.
- Despite difficulties and uncertainties, ICRISAT remains committed and continues to conduct quality research.
- ICRISAT's research is conducted in collaboration with a large number and diverse array of partner organizations.
- The ICRISAT Board has focused on keeping the center on course during turbulent times, and has contributed significantly to greater stability and direction over the past three years.
- The Director General has successfully focused effort and attention on building a unified and motivated ICRISAT.
- The quality of research in Africa is exemplary, as is the wide network of partners that ICRISAT has put together.
- A period of stability has begun, with improved organizational structures, and with strengthened financial, human resource, information and support systems in place.

These endorsements of our efforts and achievements are most reassuring, and I would like to make public my profound appreciation to both panels for the seriousness of purpose with which they undertook their assignments.

These accomplishments did not 'just happen'. The Governing Board acknowledges the dedication of the staff of ICRISAT as well as the stability that has been established during the last three years by Management under our able Director General.

Indeed, it has been a banner year for Director General Dar as well as for the institute as a whole. Let me refer to two recent honors that have come his way.

At the Governing Board meeting of the Future Harvest Foundation on 15 May at The Hague, Dr Dar was honored by being elected Chairman of the Board, succeeding Dr Hubert Zandstra, Director General of the International Potato Center, for a period of two years. The Future Harvest Board recommended the need to include a broader spectrum of stakeholders at the policy level to revitalize the Foundation, so Dr Dar's first initiatives as Chair have been to fill newly created positions. Meanwhile, his duties as Chairman of the Public Awareness and Resource Mobilization Committee (PARC) of the CGIAR continue.

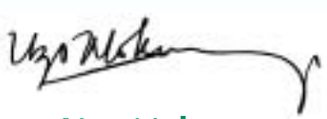
On 11 April, Dr Dar was conferred an honorary degree of Doctor of Science by the Mariano Marcos State University (MMSU) in Batac, Ilocos Norte, Philippines, for 'significant achievements in agricultural research and development'. The ceremony took place during the university's 25th commencement exercises, and was the first time MMSU has conferred such an honorary degree.

On behalf of the entire Governing Board of ICRISAT, I salute Dr Dar for being singled out for these important distinctions.

Turning my attention to the Governing Board itself, let me say that I am very excited about the composition of our current Board. We have assembled one of the deepest and 'classiest' groups of individuals imaginable. Together, we will ensure that the support and clear policy cover required for the work of the institute will not be found wanting. Strong challenges lie ahead. But we are confident that the Board will provide stability and confidence to both Management and staff.

We have demonstrated through our research with a human face, especially in Asia, that we *can* make a difference in the lives of the poorest of the poor. The African semi-arid tropics (SAT) provide us with unique set of challenges, but we remain firm in our belief that we have the tools and the determination to strengthen the capacity of our African collaborators, forming new partnerships to reduce land degradation, promote the use of our improved germplasm and reduce the uncertainty that characterizes the lives of the farmers who toil in the African SAT.

While we cherish our accomplishments, we reassure our supporters that we shall not rest on our laurels.



Uzo Mokwunye
Chairman, Governing Board

Message from the Director General

Since the publication of the last ICRISAT Annual Report, *Research for Impact*, one single event stands out. For the third time in only four attempts, ICRISAT bagged the King Baudouin Award, the CGIAR's most prestigious science prize, this time with our partner ICARDA. While welcoming this recognition of the quality of our work, I reminded my colleagues that the award was also a challenge – a challenge to be even more outstanding, to maintain the high quality of our science, to build even stronger partnerships – in short, to continue generating technologies that contribute directly to the alleviation of hunger and poverty in the semi-arid tropics.

I am proud to report that the ICRISAT staff – we call ourselves *Team ICRISAT* – responded to my challenge quickly and enthusiastically. The institute was due for an External Program and Management Review in 2003, but the powers that be decided to try something new, and the reviews were split into two separate panels. Thus we were obliged to prepare ourselves for *both* an EPR *and* an EMR. This was no easy task, but once again, the staff responded with zeal and teamwork, and we passed through both reviews with flying colors.

Throughout both review documents, reference is made to partnerships. This is appropriate. There is very little we do, or hope to do, that does *not* involve partnerships. Partnerships are the keystones of success in agricultural research.

ICRISAT's penchant for partnerships extends beyond its research mandate. We have endeavored to attract a wide array of organizations to set up shop at our Patancheru headquarters. You will read in these pages of our Technology Innovation Center, which is responsible for bringing unprecedented variety to our Patancheru campus. Besides hosting representatives of two sister CGIAR centers, ILRI and IWMI, we signed a Memorandum of Agreement to work with the World Wildlife Fund for Nature on their Food, Water and Environment Project. In addition, we have opened the doors to the Sehgal Family Foundation, a private biotechnology company called Avesthagen Graine, the UK's Natural Resources Institute, as well as two Indian agricultural research organizations.

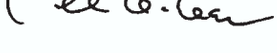
I was honored during 2003 with an invitation to join the Millennium Project Task Force on Hunger. The invitation came from two World Food Prize laureates, Dr Pedro Sanchez (former Director General of ICRAF) and my old friend Professor MS Swaminathan, Director of the foundation that bears his name. The task force, part of the UN Millennium Development Project, aims to halve the number of people who suffer from hunger by 2015.

Indeed, addressing the problem of hunger remains an imperative for ICRISAT and its partners. The 120 million people who live on the margins of deserts in Africa and Asia depend almost entirely on rainfed agriculture and natural rangelands for their survival. One of the best ways to address such problems is through innovative channels for information, communication and education using an appropriate blend of ICT and distance learning. With this in mind, we have set up a Virtual University for the Semi-Arid Tropics (VUSAT), a seamless coalition that can provide African and Asian farmers with relevant information, knowledge and skills to empower them to make better decisions, increase productivity, and improve livelihoods. These endeavors will form part of a global network of similar virtual learning centers for farmers organized by various international and regional organizations.

Let me again refer to the Team ICRISAT movement. Launched at Patancheru in early 2002 to invoke a greater sense of unity and team spirit, we subsequently held similar activities in each of our African locations. An excellent example of the spirit of Team ICRISAT was our recent 'War on Parthenium' at Patancheru. Parthenium, an obnoxious weed, was growing out of control. But instead of wringing our hands in desperation, we rolled up our sleeves and marched off to battle. Everyone joined in – management, food services staff, security guards, drivers, scientists – and in a single August afternoon, together, we laid waste to this destructive pest. Never underestimate the power of team effort!

After the devastating droughts of 2002 in India and parts of Africa, we have been blessed on both continents with good rains in 2003. For this, we are truly grateful. But the erratic rainfall patterns that bedevil the semi-arid tropics will inevitably spawn future droughts, as well as destructive floods. The poor soils that typify our eco-regional mandate, continually degraded by overfarming and overgrazing, pose a remorseless menace to the survival of the world's poorest people. Clearly, the challenges of improving conditions in the dry tropics of the world will not fade away. That is why we must continue to build an ever stronger ICRISAT.

With the strength that comes from dedicated staff, relevant programs, genuine partnerships and a supportive Governing Board, I am confident that Team ICRISAT will be equal to the task.



William D Dar
Director General

Subsistence farming to the dust bin

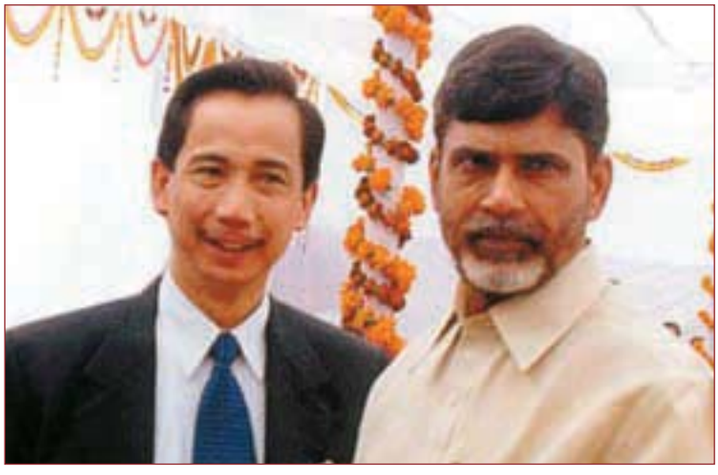
A few years ago, s*ubsistence* was a word routinely applied to agriculture in the semi-arid tropics. Farmers produced crops for their own consumption and barely made ends meet. But farmers, tired of being poor, are asking new questions. Farming in the SAT is not just about livelihoods. It's about business.

There's no question about it. Agribusiness for farmer groups and emerging entrepreneurs in the developing world is growing. Recognizing these trends, ICRISAT now concerns itself with the *transfer* – not just the *generation* – of technology. This shift from reactive to proactive has resulted in a concept called the Technology Innovation Center (TIC). TIC embraces several ventures.

Genome Valley: Hyderabad's newest initiative.

A new shade of green

The government of Andhra Pradesh, ICRISAT's host state in India, has ambitious plans for biotechnology. The state's Genome Valley Project is a far-sighted venture involving research institutes, universities and private companies. Says Mr Chandrababu Naidu, the energetic Chief Minister of Andhra Pradesh, 'Biotechnology is a frontier technology with the potential to provide benefits to all sections of the society, but more so the very poor, by facilitating the manufacture of cheaper, safer and more effective drugs, improving the quality of livestock and agriculture, thus improving the quality of life itself.'



Director General Dr Dar and Andhra Pradesh Chief Minister Chandrababu Naidu put their heads together on behalf of the state's farmers and entrepreneurs.

Because Genome Valley itself is largely focused on industrial biotech, Mr Naidu has asked ICRISAT to take the lead in agricultural biotechnology, or *agri-biotechnology*.

Keeping the nest warm

Enter the Agri-Business Incubator (ABI). The idea behind ABI is to invite fledgling businesses to the campus and nurture them by providing facilities, technology, equipment and expert advice until they're ready to move out and take flight on their own. In other words, we're using the word *incubate* literally. We optimize the use of our facilities by sharing them with an array of partners, while simultaneously disseminating our research results.

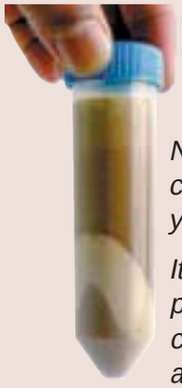
The wheels are in motion. The Indian Government's Department of Science and Technology (DST), which provided initial corpus funding of Rs 2.5 crore ($520,000), will also assist entrepreneurs with soft loans and arrange secondments of students from prestigious academic institutions to conduct market and feasibility surveys.

ABI already has its own Board of Governors, chaired by ICRISAT Director General Dr William Dar. It has a Standing Advisory Committee that includes experts drawn from DST, the Indian Council of Agricultural Research (ICAR), the Andhra Pradesh State Seeds Corporation, the National Bank for Agriculture and Rural Development and the Andhra Pradesh Industrial Development Corporation. ICRISAT has lined up a number of technologies that entrepreneurs can use in their businesses. These include:

- *Helicoverpa* nuclear polyhedrosis virus (HNPV) production to control Indian farmers' most important adversary (see box)

Biological warfare

Helicoverpa armigera*, the dreaded pod borer, is the single most important pest in modern agriculture. It attacks nearly 200 kinds of crops, including cotton, legumes, cereals, vegetables and fruit. Losses across the world amount to a whopping $2 billion every year. That's not all. An additional $500 million is spent annually on insecticides to control this voracious caterpillar. But even these vast amounts of poisons cannot stem the tide.*

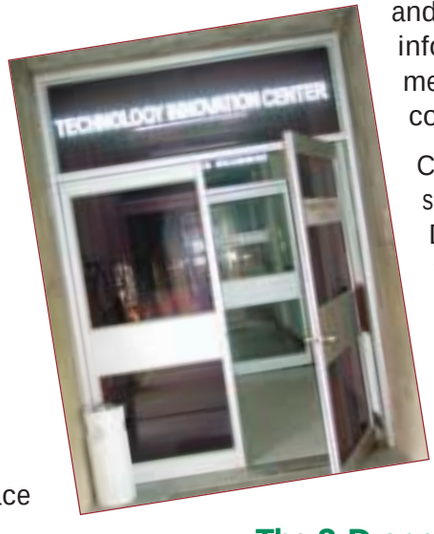


The answer may be biopesticides; specifically, NPV, a naturally occurring fatal viral disease in pod borer. The process of making NPV is simple – gruesome, but simple. You gather the carcasses of caterpillars killed by NPV, liquefy them, then spray the stuff on your crops.

It also happens to be a very lucrative business proposition. Industrial production of insecticide costs about $17 per hectare. But with NPV, costs are only about $3.40 per hectare, one fifth that of the commercial alternative. Plus, it's not hazardous to human health at all.

Helicoverpa *meets its match in NPV.*

- Use of naturally occurring *Bacillus* species for the control of insects and cost-effective mycotoxin detection systems for seed, food, feed and fodder
- Development of transformation protocol for commercial crops
- Marker development for traits of interest for seed producers



A virtual possibility

Information isn't really information until it's disseminated. For the tens of millions of farmers who periodically face severe drought, getting the right information at the right time can make all the difference. That's the idea behind VUSAT, the Virtual University for the Semi-Arid Tropics. Initiated jointly by the MS Swaminathan Research Foundation and ICRISAT, VUSAT provides critical information about monsoon behavior, methods of drought management and community mobilization.

Contributing to VUSAT are national bodies such as ICAR, the Indian Meteorological Department, state governments and several universities. VUSAT also draws from expertise available with the Canada-based Commonwealth of Learning, the International Water Management Institute (IWMI) and other international agencies.

The 3-D approach

When all said and done, what makes TIC tick is more than the sum of its parts. Its '3-D' catchphrase – *Discovery, Development and Dissemination* – sums up ICRISAT's approach to fighting hunger, poverty and environmental degradation. It is no longer enough for us to develop cutting-edge technology and hope that it will trickle down to resource-poor farmers. We need to proactively push the technology we generate into farmers' fields throughout the semi-arid tropics. ♦

ICRISAT's resources are on offer to fledging entrepreneurs.

Information is power to millions of drought-prone farmers in the SAT.

Kate Longley in the field with Afghan enumerators in Kunduz. (Photo: Abdul Sabur, Afghan Survey Unit.)

Rebuilding Afghanistan's agriculture

Afghanistan's years of war and civil strife, aggravated by three debilitating years of drought, resulted in the collapse of agricultural production systems. Responding to the problem, several CGIAR centers formed a consortium led by ICARDA. Center scientists met to establish research activities and set research priorities in collaboration with national partners and international agencies.

Afghanistan is landlocked, with rugged mountainous terrain and vast arid and semi-arid areas. Of the country's total area of 65 million hectares, less than 4 million are cultivated. Nonetheless, Afghanistan is a mainly agricultural country with 85% of the population involved in farming. Prior to its unbroken 23 years of war, Afghanistan was self-sufficient in food.

Mr Mohammed Sharif, Afghanistan's Deputy Minister of Agriculture (right) is welcomed to ICRISAT-Patancheru by Farid Waliyar (left) and Dyno Keatinge (center).

One of the CGIAR projects is called *Strengthening seed systems for food security in Afghanistan*. Funded by Canada's International Development Research Centre (IDRC), the project is devoted to understanding the damage inflicted on the indigenous seed system and germplasm resource base. Special attention is given to rainfed areas, particularly where farming populations have been displaced. The project examines farmers' strategies and forges effective linkages between the local and formal seed systems. Once the results are in, the focus will shift to the development of a village-based seed production model built around farmer participation.

The project is being implemented by a multi-disciplinary team comprising representatives of IARCs, NGOs and Afghan institutions spanning disciplines and experience in plant breeding, social anthropology, seed technology, crop production and crop economics. ICRISAT scientists Farid Waliyar (an Afghan by birth), Richard Jones and Kate Longley provided inputs to the drafting of the project proposal in 2002. Waliyar and Longley took part in a

methodology planning meeting in Kabul in March 2003, and IDRC provided funding to assist Longley in her efforts to understand the seed system and plan for the next phase of the project.

In June 2003, Longley traveled to Kunduz in northeastern Afghanistan to train a team of enumerators from the Afghan Survey Unit in the facilitation of focus group discussions. The discussions are aimed at collecting qualitative data from separate groups of village leaders (both men and women) on local seed management practices and changes in the varieties of wheat, barley, chickpea and melon in Baghlan, Badakshan, Kunduz and Takhar provinces. The qualitative data collected through the focus group discussions will be complemented by quantitative data collected through household and crop surveys.

Linking relief to rural livelihoods

Another initiative involving ICRISAT is funded by the European Community's Poverty Reduction Effectiveness Programme. This project aims to develop a greater level of conceptual clarity and to identify practical strategies for formulating agricultural rehabilitation policies linking humanitarian assistance and longer-term development to rural livelihoods. The transition from humanitarian relief to rehabilitation is particularly problematic where continuing violence prevails. The weakness (or absence) of formal and informal institutions, the lack of political legitimacy, and high risks associated with economic investments, are all part of the problem.

The collaborating organizations, besides ICRISAT, which is represented by Longley, are the Overseas Development Institute (ODI), led by Ian Christoplos, and the FAO's Rehabilitation and Humanitarian Policies Unit, led by Richard China.

Training enumerators and facilitators from the Afghan Survey Unit. (Photo: Sam Kugbei, ICARDA.)

The project will produce relevant policy and programming frameworks for targeted rehabilitation interventions. It will do this in three steps.

1. Synthesize existing conceptual and case material into an analytical framework for relating policy options to an understanding of livelihoods.
2. Apply this framework to studies of agricultural rehabilitation and poverty reduction in two case study countries (Afghanistan and Sierra Leone).
3. Develop and disseminate frameworks to assist donors, policymakers and program managers in formulating new approaches to agricultural rehabilitation in a range of situations.

Nad Ali, arriving for training at Patancheru, is greeted by Director General Dar and Dr V Balaji, Head of ICRISAT's Information Services Unit.

The project will be led by ODI, which has international expertise in both rural development and humanitarian relief, as well as an established reputation for work on aid policy and performance. Collaboration with FAO and its wide range of stakeholders will ensure a practical, results-oriented approach.

Training

Following discussions with Afghanistan's Ministry of Agriculture and IDRC to link farmers with national and international markets, it was deemed imperative to build the capacity of national staff in information and communications technology. IDRC stepped forward to fund the training of Mr Nad Ali, an officer with Afghanistan's Ministry of Agriculture, for three months at ICRISAT-Patancheru. ♦

Seeds of Life

Timor-Leste, the world's newest country, was formerly a Portuguese colony and subsequently an Indonesian province. When its inhabitants overwhelmingly voted for independence in August 1999, terrible civil strife ensued, resulting in widespread damage to infrastructure and disruption of farming activities.

The state of agriculture was critical. Seeds had been either consumed or destroyed. Responding to the call, the Australian Centre for International Agricultural Research (ACIAR) took the initiative of putting together a project called Seeds of Life.

The project was started in 2000 to improve food security and give a healing touch to agriculture through the introduction, testing and distribution of improved germplasm of the major food crops. The three-year project is a collaborative effort among ACIAR; Timor-Leste's Ministry of Agriculture, Fisheries, and Forestry (MAFF); Catholic Relief Services; and five CGIAR centers: CIAT, CIMMYT, CIP, ICRISAT and IRRI. Coordination is the responsibility of ACIAR. The collaborative effort aims to help rebuild the agricultural, scientific and agribusiness capacity in the country.

Specific objectives

- Under a range of soils and climatic conditions, evaluate the adaptation of a range of lines of rice, maize, cassava, beans, sweet potato and groundnut.

ICRISAT's improved varieties (left) dwarf the local varieties (right).

ICRISAT groundnut trials at Fatumaca.

- Identify and multiply lines with improved environmental adaptation and tolerance for biotic (pests and diseases) and abiotic (drought, low fertility) stresses
- Improve farmers' access to high quality seeds of the best-adapted cultivars
- Develop a crop performance database over a range of environments for future development programs
- Build capacity of local institutions and staff in evaluation, production and distribution of improved germplasm and integrated crop management

More than 90% of Timor-Leste's people live in rural areas and engage in subsistence farming. Food crops contribute almost 52% to rural GDP and the rest comes from plantation crops (26%), livestock (20%), forestry (1%), and fisheries (1%). The major food crop is maize, followed by rice, cassava, sweet potato, groundnut and soybean. The country must import rice to meet its food demand.

This project, which has brought together five CGIAR centers, reflects the centers' efforts in Afghanistan, Rwanda and other countries laid low by civil and natural catastrophes.

Strong national support to the project was evident when the President of the National Council for Resistance in Timor, Mr Xanana Gusmao (later elected the first resident of the country), praised the ACIAR initiative and welcomed the partners to work with the national program.

In the first year of multilocation evaluation, several promising groundnut lines, each performing better than the local materials, were identified for various agroclimatic zones. After the second year, promising materials were selected for on-farm participatory trials. Involvement of national staff at all levels is essential to promote their sense of ownership of a collaborative project. Transparency in planning and operation, respect for national concerns on content and protocol, appreciation for local limitations and mutual respect among partners are essential for successful implementation of a collaborative project.

ICRISAT's involvement with Seeds of Life, thus far confined to groundnut, may soon expand to sorghum. Mr Estanislao da Silva, who heads MAFF, has evinced keen interest in getting improved sorghum material into the hands of Timor-Leste farmers. Sorghum is grown sporadically throughout the country, where it is known as *batar ainas*, which means 'tall corn' in the local language. Tall indeed at about 4.5 m, the crop is mixed with maize and eaten, and is also fed as both grain and biomass to livestock. ♦

Francisca Aluiscorea with her local sorghum in Liquiça, on the north coast, west of Dili, the country's capital city.

The Seeds of Life research farm at Alieu.

A new Sahel – sun, sand and salvation

New alternatives for ancient lands.

The *Sahel*… in Arabic the word means coastline, or edge. The Sahel is the great dryland belt underlying the Sahara Desert, the northern perimeter of sub-Saharan Africa; in other words, the desert margin – a bleak, unforgiving landscape.

Agriculture is possible in the Sahel, but just barely. The farmers who labor there, desperately trying to coax crops out of the tired soils that typify the region, are regularly threatened by droughts, sandstorms and other challenges. But as wretched as this scenario may appear, ICRISAT and its research and development partners do not think of the situation as hopeless. Novel approaches that capitalize on linking farmers to markets, combined with new scientific breakthroughs, are opening doors many thought would remain closed.

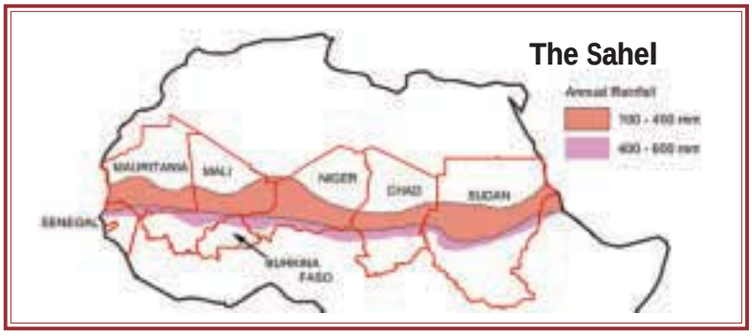
The battle to mitigate the problems of the Sahel has been joined on many fronts. The commonality of the various approaches is their participatory nature. Countries identify their particular constraints and priorities, and a range of partners – donors, research institutes, NGOs – help them identify the appropriate expertise to move ahead. Solutions are multi-pronged. The Desert Margins Program, for example, covers aspects such as fertilizer micro-dosing, community-run credit plans, application of molecular markers and genetic diversity to increase *Striga* resistance, modern IT for climate prediction and decision support, reduction of carcinogenic aflatoxins in foodstuffs, exploitation of biodiversity to enhance soil organic matter, adoption of traditional knowledge to enhance the use and competitiveness of traditional landraces in evolving agricultural systems, and village level studies.

Two particularly notable initiatives are the Sahelian Ecofarm and the African Market Garden.

The Sahelian Ecofarm, an integrated land use system that incorporates high value multi-purpose plants with soil and water conservation structures, promises to bring benefits to farmers in the form of fuelwood, forage, cash, plant nutrients, biomass for mulch and protection from wind erosion.

Ingeniously planned, the Sahelian Ecofarm features strategic choices in the placement of trees, hedges, grass and annual crops. Consider this model:

1. *Acacia colei* trees are planted at 2-meter intervals along the perimeter of a 1-hectare field. *Acacia* produces substantial biomass for mulch, fixes nitrogen, and its seeds can be used as a constituent of poultry feed.
2. Two rows of *Acacia* are alternated with one row of *Zizyphus mauritiana* (pomme de Sahel). These are planted in beds shaped like halfmoons, called *demi-lunes*. The apple-like fruits are harvested for income generation, and the *demi-lunes* are shaped for water retention around the base of each tree.
3. An earthern bund connects a line of *demi-lunes*, forming a 'moonbund'. *Andropogon gayanus*, a hardy perennial grass that spreads by runners, holds and stabilizes the soil in the moonbund. The culms are widely used by the local population for weaving grass mats for thatched roofs and fences.



4. Besides two traditional food and animal feed crops, cowpea (*Vigna unguiculata*) and millet (*Pennisetum glaucum*), the Sahelian Ecofarm also features plantings of roselle (*Hibiscus sabdariffa*) between the rows of trees. Roselle, originally from Southeast Asia, has become adapted to the Sahel. The leaves can be eaten as a green vegetable, and its calices are used in the production of drinks, herbal teas, juices, jellies, ice cream flavors, and natural food dyes.

This Sahelian rainfed tree-shrub-crop model generates $680 per hectare in revenue – *13 times more* than the $50 received from the traditional sole millet crop – and is far more environmentally sustainable.

Other potential species for the Sahelian Ecofarm include sorghum, sesame, cluster beans, calabash, watermelon, senna, *Jatropah curcas*, sweet tamarind, aonla, figs and *Boscia senegalensis*.

A row of A. colei *surrounds the field in the Sahelian Ecofarm.*

The African Market Garden (AMG) is a small-scale horticultural production package based on low-pressure drip irrigation, requiring just $60 to outfit an 80 m² area, and pays for itself in the first year. Manifold boosts in income are possible from cultivating date palm ($100/year/tree), papaya ($50/year/tree), table grapes, figs, citrus, pomegranates and vegetables – for both domestic and international markets.

The demi-lunes and moonbunds conserve water, providing moisture for each tree.

The benefits of the AMG system include higher yields of improved quality vegetables and fruits, the ability to produce crops year round, an efficient utilization of water resources, decreased labor requirements for irrigation and weeding, and greater likelihood of maintaining the productive capacity of the soil.

The hardware components of the AMG system are a concrete reservoir, the plastic drip irrigation kit (a basic unit covers an area of 500 m^2), and a water pump.

Through its biggest asset, its powerful partnerships, ICRISAT avidly pursues remarkable new science-driven opportunities for the long-suffering peoples of the Sahel. This vigorous new market-oriented agriculture is bound to transform lives and lands along this northern perimeter of sub-Saharan Africa. ♦

Simple screens protect young trees from wind erosion and provide cooling shade.

Tomatoes and other vegetable and fruit crops can thrive in the African Market Garden.

Yellow gold in Myanmar

Myanmar's yellow gold is often intercropped with sunflower.

Chickpea has exploded in popularity among farmers in Myanmar, with ICRISAT's warhorse ICCV 2 riding the crest of this wave. The area cultivated to this immensely successful variety has witnessed a spectacular *fourfold* increase over the past three years. Considering that the average yield of chickpea in Myanmar increased from 660 to 1007 kg/ha during this time span, such accelerated adoption is understandable.

Of the 192,000 hectares sown to chickpea in the 2001/02 season, 56% of the area was under ICCV 2 (released as Yezin 3 in 2000). Another 11% is under a second ICRISAT-bred variety, ICCV 88202 (Yezin 4).

The crop is cultivated mainly in the northern parts of the country, a large dry zone that consists of Sagaing, Mandalay and Magway divisions. The average annual rainfall in upper Myanmar is only 700 mm, as compared to lower Myanmar (Yangon, Bago and Ayerwaddy divisions) where three times as much rainfall can be expected.

Sagaing is the major chickpea-growing division, contributing 54% the area and 62% of chickpea production in the country. Yezin 3 alone covers 85% of the area under chickpea in Sagaing.

Why has Yezin 3 been so successful here? The reason has to do with Sagaing's short growing period, which necessitates an extra-short-duration variety. And because Yezin 3 is a *kabuli* type, it is preferred as food to the traditional *desi* types. The high demand for the variety is not only replacing the local varieties, but even the traditional wheat crop.

Burmese farmers prefer the variety for four reasons.

- It is short duration – matures in only 85 days.
- Its early maturity allows it to escape terminal drought.
- Being a *kabuli* type, it fetches a higher market price.
- It is resistant to fusarium wilt.

Yezin 3 has created nothing less than a revolution in some areas of Myanmar. Some farmers intercrop it with sunflower. Farmers near Patheingye town in Mandalay division broadcast chickpea seeds in rice fields 8-10 days before harvest. This saves time and enables them to grow three crops a year – rice during monsoon, chickpea during winter, and sesame or sunflower during summer.

Before the introduction of Yezin 3, farmers grew local chickpeas in relay cropping situations. *Kabuli* types had thin seed coats and gave poor plant stand. The variety most popularly used is the late-maturing 'Karachi local'. Despite the problem of plant stand in other *kabuli* types, farmers found that Yezin 3 could overcome this difficulty because of its early maturity, providing them a wide

window for cultivating a summer crop. The farmers use at least 50% more seed to get good stand from ICCV 2. Nearly 30% of the chickpea area in relay cropping around Patheingye is now sown to Yezin 3.

Mr U Ba Than, a farmer from Aleban village near Pale Myo town, first tried out ICCV 2 in 1986. He sowed the 200 seeds he received from Myanmar's Central Agricultural Research Institute, and has never looked back. He plants nothing else to this day. A trendsetter in his district, Mr Than has introduced the variety to dozens of his friends and neighbors. He says that Yezin 3 has changed the whole lifestyle of the farmers in the area by bringing new prosperity. They now ride to their farms on motorcycles rather than bicycles, live in brick rather than bamboo houses, and watch television instead of listening to radio.

Farmers in the area also find it more remunerative to grow chickpea than wheat. The financial returns from wheat were not encouraging, since farmers were constrained to deal with a hot, short growing season aggravated by the vagaries of the monsoon. Yezin 3 ensured them of higher yields and larger incomes.

Myanmar's chickpea pioneer, Mr U Ba Than.

Like all of ICRISAT's breeding successes, this one was brought about through a superb partnership with Myanmar's national program.

ICRISAT's kabuli *varieties have won over thousands of farmers and consumers.*

The success of ICCV 2 in Myanmar reflects a similar pattern in other countries: India, Nepal, Ethiopia, Bangladesh and others. The world's shortest-duration *kabuli* chickpea cultivar, ICCV 2 was developed by ICRISAT from a multiple cross that involved five parents. It was the first *kabuli* chickpea successfully grown in tropical environments. Other varieties failed, since they took a long time to mature, could not tolerate heat and were susceptible to fusarium wilt and drought. Because ICCV 2 is generally raised on residual soil moisture in rainfed areas, it has become the preferred cultivar for sowing in rice fallows. ♦

The struggle for food security involves farmers of all ages.

Old crops, new horizons

Drought has stalked southern Africa for a long time, and the biggest victims are invariably smallholder farmers. Working on nutrient-starved soils, with little access to modern technologies, markets or credit, they lived from season to season. Many aimed simply to feed their families, and in many years they failed. But things are changing, thanks to partnerships engendered by ICRISAT and implemented through the SADC/ICRISAT Sorghum and Millet Improvement Program (SMIP), which completes its activities this year.

SMIP began 20 years ago. At a meeting of SADC (Southern African Development Community) heads of state in 1983, a recommendation was made to place greater emphasis on smallholder rainfed farming. Specifically, ICRISAT, because of its acknowledged leadership in research on drought-tolerant crops, was asked to lead a regional R&D program targeted at drought-prone areas across southern Africa. USAID emerged as the principal donor for the program, with additional support from the German BMZ/GTZ and the Canadian International Development Agency.

Now that the program is winding down, it is useful to take stock of what it has accomplished. The results are nothing less than remarkable. Nearly 50 improved sorghum and pearl millet varieties have been released in eight SADC countries, compared to only 24 releases during the 20 years preceding SMIP. Adoption of these materials increased steadily over the two decades of research. Improved varieties now occupy 25-30% of the sorghum and pearl millet area across the region, and as a result food security and nutrition have improved enormously. Simultaneously, national research capacity has been strengthened through technical support, infrastructure development, training programs and sponsorships for higher education. Seed systems have been beefed up, allowing smallholder communities to access seed of improved varieties. A participatory approach to research with farmers as partners has led to significant increases in adoption levels. Perhaps most important for the long term, SMIP is linking farmer groups with private-sector seed companies, creating new market opportunities and helping them make the transition from subsistence to commercial agriculture.

SMIP's headquarters are located near Bulawayo, Zimbabwe, at Matopos Research Station, one of the oldest such facilities in Africa (it celebrated its centennial anniversary this year). Operations span the entire SADC region, the primary work conducted in four target countries and disseminated across the region through networks.

The research agenda has evolved over the years in response to specific needs identified jointly by ICRISAT scientists, their NARS counterparts, and the farmers themselves. In 1980s and early 1990s, the emphasis was on strengthening national research capacity and infrastructure, and on developing improved, drought-tolerant varieties. Over 900 NARS researchers were trained, through degree programs, in-service technical training, and other means.

Once a significant number of varieties had been developed, the emphasis shifted to three other areas – seed systems, crop management, markets – to allow farmers to benefit fully from the yield gains the new varieties offered. Technology exchange grew more important, and innovative dissemination methods were developed. When demand for the new varieties began to outstrip supply, the focus switched toward improving seed systems and easier availability of good seed at reasonable prices. Another key aspect was commercialization: linking farmers to markets.

Partnerships

Why has SMIP been so successful? In a word, partnerships. The SMIP Mid-Term Review, conducted by an external panel in July 2001, concluded: 'SMIP has established solid foundations for new partnerships which will help define the course of sorghum and millet research in the region.'

A Miracle called Macia

Jacob Masunda is a smallholder farmer in Mhandamabwe, a village in one of Zimbabwe's driest areas. He is part of a smallholder seed cooperative that grows ICRISAT's sorghum variety Macia, on contract to a multinational seed company.

A Zimbabwean breeder evaluating a regional Macia trial.

'I have been growing sorghum all my life,' says Masunda. 'But Macia is the highest-yielding variety I have ever planted.' His 5-hectare field is remarkably productive because he uses not just improved varieties but the full range of crop, soil and water management technologies that ICRISAT promotes. Winter plowing to improve soil structure, weed control to maximize yields, manure-fertilizer combinations, water-harvesting pits, tied ridges for water conservation.... So astute a farmer is Mr Masunda that even in his low-rainfall area, during a drought year, there were moist patches in his field – moisture accumulated and retained for two and half weeks following the last rainfall. 'This used to be dry land,' he says. 'I have converted it into a wetland – maybe next season I can even plant rice!'

The SMIP approach involves partnerships from planning to dissemination of results. Partners are identified and responsibilities shared on the basis of comparative advantage. Over 70 organizations work together: national research and extension, NGOs, CGIAR centers and other advanced research institutions, regional and subregional organizations, farmers' groups, and many others. Each partner contributes specialized skills in specific areas and contributes resources, either in cash or in kind (staff time, vehicles, fuel). The important thing is that every stakeholder participates.

Food security and variety adoption

The new varieties mature 3 to 6 weeks earlier than traditional varieties, a crucial advantage in a region where end-of-season drought occurs every other year. In practical terms, they ensure a harvest in years when most other crops would fail – nothing less than a food security revolution in a region where hunger is the norm.

Linking farmers to markets has been one of SMIP's priorities.

Adoption has been widespread. In Zimbabwe and Tanzania, the biggest producers in the region, adoption is 25-45%, and rising. Or take Namibia: an arid, highly drought-prone country where pearl millet is by far the most important food crop, and where ICRISAT variety Okashana 1 is grown on 49% of the country's millet area. Investments of about $3 million in developing this variety yielded a stream of benefits worth over $11 million. The internal rate of return on this investment is an astounding 60%.

Legumes grown in rainfed conditions do much to alleviate drought in southern Africa.

Building for the future

SMIP has not only championed the new approach and built consensus among NARS, but also provided scientific backing for regionalization. SMIP scientists, analyzing data from variety trials conducted over the past 15 years, were able to group test sites into clusters that represent the conditions of each of southern Africa's major agro-ecologies. The NARS have backed the idea, and variety evaluations are now conducted over a small number of representative sites, rather than a large number of sites across each SADC country, with no loss of scientific validity. The result? Greater efficiency, lower costs and less time. ♦

Groundnut for West Africa

Groundnuts, which are usually cultivated by women in West Africa, are more than just a confectionery product. They provide both food for children and fodder for livestock.

Groundnut is one of the most important crops in West and Central Africa (WCA). Managed almost exclusively by women, it is a source of high protein and energy for children, as well as high-quality feed for livestock.

The crop also plays a significant role in maintaining the health of the agricultural economy in the region. Nigeria, with an average annual production of 2 million tons, is the world's third largest producer, and Senegal is the fifth. The yields obtained, however, are less than half those of China and India, and only a quarter of those in the USA.

Groundnut in the region has been severely threatened by drought and disease (see box). Enter the Groundnut Germplasm Project for West Africa. An initiative of the Inter-Governmental Group on Oilseeds, Oils and Fats of the FAO, with financial support from the Common Fund for Commodities (CFC), its international partners were France's Centre de coopération internationale en recherches agronomiques pour le développement (CIRAD), Senegal's Institut sénégalais de recherches agricoles (ISRA) and ICRISAT. Regional partners included the national agricultural research systems (NARS) of the region, the West and Central African Council for Agricultural Research and Development (CORAF/WECARD) and the African Groundnut Council.

The six-year project, which concluded successfully in December 2002, was able to restore genetic diversity to groundnuts, enabling NARS researchers to get improved seed into the hands of smallholder farmers. The project was developed along six specific initiatives.

1. *Assembly and conservation.* The partners assembled 6000 diverse groundnut germplasm accessions from the global genebank at ICRISAT-Patancheru, conserved them in a regional genebank at ICRISAT-Niamey, Niger, and maintained them at international standards.
2. *Characterization and evaluation.* The germplasm was characterized for important botanical and agronomic traits and screened for important biotic and abiotic stresses. Among the biotic stresses, early leaf spot, late leaf spot, rust and rosette virus disease are the principal constraints. The germplasm was screened for resistance and an impressive 426 sources of resistance were identified.
3. *Resistance to drought and aflatoxin contamination.* Drought causes unstable yields and increases vulnerability to aflatoxin contamination, a major food safety issue. From the assembled germplasm, 67 aflatoxin-resistant lines were identified.
4. *High-yielding improved varieties.* The partners evaluated 92 promising varieties in 11 West and Central African countries. Four early-maturing rosette-resistant varieties and three medium-maturing varieties were proposed to the National Variety Release Committee of Nigeria for registration and release.
5. *Breeder and foundation seed production.* Popular elite breeding lines were multiplied and supplied to researchers and

Bring back the groundnut pyramids!

Photo: Alain Mayeux, CIRAD.

There was a time when colossal pyramids of groundnut were a common sight in northern Nigeria. The piles – some higher than surrounding buildings – were a symbol of the abundance of the region's most important cash crop. With nearly 2 million tons a year, the country was the third largest producer of the crop. The state of Kano was once an important trading hub that sent out the legume to European markets. Today, the dusty yards lie mostly empty.

What happened?

Two major causes for the failure of groundnut in Nigeria were drought and rosette virus. Over the last 30 years changing rainfall patterns have shortened the growing season from four to three months. Groundnut, which needs more than four months to reach maturity, was badly hit. Drought brought in its wake the rosette virus, a devastating groundnut disease endemic to Africa. In 1975, a rosette epidemic destroyed 750,000 hectares of the crop and brought regional trade worth $250 million to a grinding halt. Other epidemics followed in 1983, 1985 and 1988. Many farmers simply gave up and switched to other crops.

Can the pyramids be revived?

Possibly. ICRISAT and Nigeria's Institute for Agricultural Research (IAR) have taken up the search for sustainable solutions to groundnut production. Extra-early varieties that can escape drought by maturing in less than 90 days have been developed. What's more, these varieties are also resistant to rosette.

ICGV-IS 96894 was released in 2001 for wide-scale production in northern Nigeria and is growing increasingly popular with farmers. Two medium-maturing (115-120 days) dual-purpose varieties were also released in 2001. These varieties are capable of eliminating 30-100% annual yield losses to rosette. This is excellent news for farmers who thought they had lost not only their primary cash crop but also their staple food. So there is hope. As they say in the region, 'As goes Nigeria, so goes West Africa.'

*Best of friends – Mr Bagui Traoré, a groundnut farmer from Kolokani village in Mali, was so grateful to his friend, Dr Farid Waliyar, for introducing ICG 7878, that he insisted on namely it 'Waliyar-Tiga' (*tiga *means groundnut in Bambara).*

NGOs. The project assisted NARS to produce limited quantities of breeder and foundation seed at the national level. About 30,000 tons of high quality seed was produced.

6. *Strengthening national R&D capacity.* The project partners succeeded in dramatically upgrading the skills and competence of staff in the project area. National scientists received training in genetic resources and genebank management, diagnosis and detection of viral diseases of groundnut, and evaluation of aflatoxin contamination.

In short, the project established a regional network for the sustainable conservation of germplasm. It provided for the development, free distribution and exchange of improved seed material. And it enhanced the capacity of the national research systems to handle and improve germplasm. The Groundnut Germplasm Project for West Africa has been an unqualified success. ♦

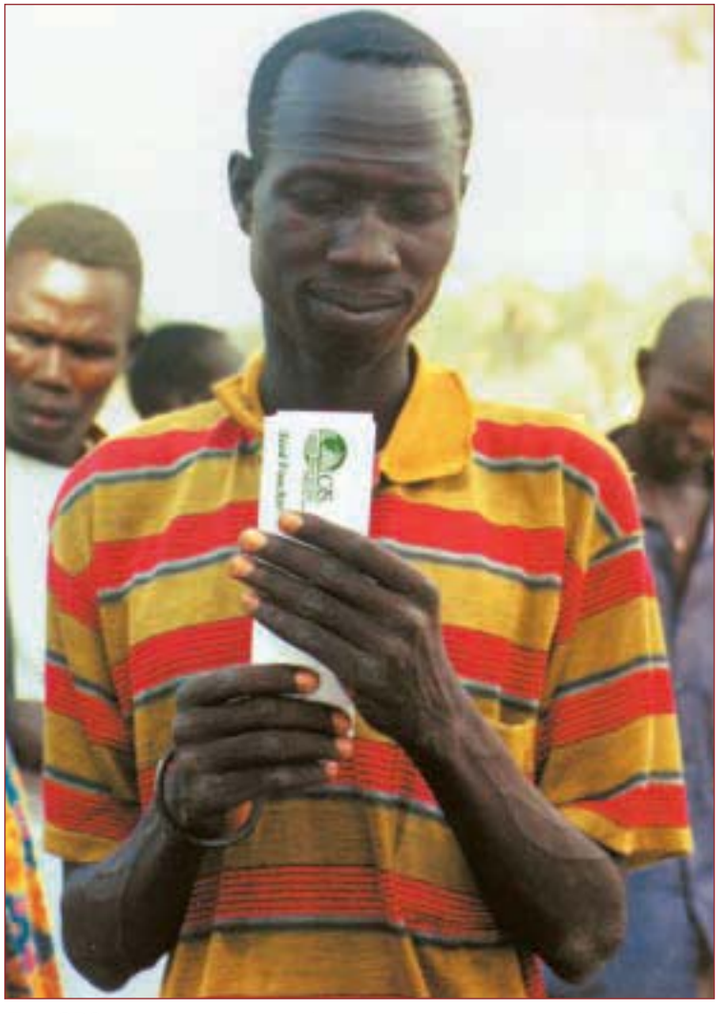
Birds of a feather

In the late nineties, ICRISAT began looking into the integration of legumes into the rice/wheat systems of South Asia's Indo-Gangetic Plains. While logistics were being worked out in Delhi, representatives of ICRISAT and Catholic Relief Services (CRS) realized they could benefit from each other's help, and a successful collaboration was born.

Subsequently, when ICRISAT became involved in similar projects in various Indian states, we needed a partner with good contacts with the farmers. Who else but CRS?

The story repeated itself across eastern Africa. ICRISAT and CRS staff fell into step together everywhere: Sudan, Kenya, Ethiopia, Eritrea, Uganda, Tanzania. By mid 2003, the two organizations were collaborating on no fewer than 10 projects.

Coincidence? Not really. Simply a matter of having the same goals and a similar approach. ICRISAT's mission, to ensure that the benefits of its research reach the poorest of the poor, is reflected by CRS, a humanitarian agency of the international Catholic community. Founded over 50 years ago to serve the poor and disadvantaged, CRS works in 87 countries – 30 of them in Africa.



The CRS voucher and seed fair approach has proved an effective alternative to traditional seed distribution.

Until the CRS/ICRISAT partnership in Tanzania's Mwanza district brought chickpea into farmers' fields, no crops were cultivated there during the postrainy season.

So whether it's identifying a new variety for poor farmers in eastern India or seed relief in southern Sudan, common goals and overlapping interests have led, time and again, to partnerships that work exceedingly well. But what makes this relationship remarkable is that no high-level meeting or deliberate policy agreement has taken place. The glue that binds the two organizations together is a set of common objectives.

A fair distribution of seed

African agriculture has many enemies. Two of the worst are drought and conflict, which together displace thousands of poor farmers every year. Arriving penniless in new environments without seeds or farming implements and few skills, they are reduced to accepting handouts to survive. This is a humiliating situation for farmers accustomed to providing for their families.

Seed relief is usually about distributing free seed to the affected communities. But field work by ICRISAT, CRS and another partner, the Overseas Development Institute (ODI), indicated that these programs are wrong for two reasons. For one, farmers may not get the crop or variety they want because decisions are often made by an uninformed external agency. For another, seed purchases outside the community do not benefit the local economy. CRS uses a different approach. It organizes seed fairs where farmers, instead of receiving free seed, get vouchers that can be exchanged for seed. Why does this make a difference? First, flexibility. Each recipient is free to choose what crop and variety to 'buy'. Farmers can exchange their vouchers for whatever they feel would be most useful. Second, availability. The bulk of the seed is purchased from local farmers, so most of the relief dollar goes to the affected community.

CRS launched the first seed fairs in Uganda. The program expanded rapidly – Burundi, Kenya, Sierra Leone, Tanzania, Sudan. ICRISAT recently introduced the concept to Mozambique as well, with technical support from – who else? – CRS. The fairs have been extremely popular with both farmer beneficiaries and seed sellers.

Chickpea to the horizon – new prosperity for poor farmers.

Farm-to-market linkages

In Tanzania, the ICRISAT-CRS partnership is part of a broader collaboration that includes local NGOs, national research and extension programs, and farmer groups. The alliance provides technology and seeds directly to smallholder farmers, and links these farmers to high-value niche markets to help alleviate poverty on a wide scale. The partnership has been strengthened through each institution's investments in time and funds to complete complementary tasks – CRS provides the direct link to smallholder farmers; ICRISAT provides the relevant technology and seeds.

Drought in Kenya, always a danger, was devastating in 2001. It was one of the worst in recorded history. ICRISAT and the Kenya Agricultural Research Institute (KARI), in collaboration with partners that included CRS, jointly developed an intervention strategy to help prepare smallholder farmers cope with such droughts. The main thrust is to provide seeds of early-maturing varieties. By sowing varieties that escape drought, farmers ensure themselves of a cushion of food security.

War in Sudan displaced thousands of people in 1998. Anticipating the usual response of seed relief agencies to import seed to compensate farmers for their losses, CRS, ICRISAT and ODI determined to work together to make emergency seed aid as effective as possible. They visited southern Sudan and found that the granaries of the Dinkas were full, and farmers were busy sowing their traditional varieties. On the spot, CRS made an inspired decision. Redesigning their seed program, they purchased local seed from farmers instead of importing from outside at great expense.

During the following seasons, CRS tested improved ICRISAT groundnut varieties jointly with farmers in the war-affected areas of northern Uganda and southern Sudan. For the first two seasons, the response from farmers was mixed: 'The varieties were fine, but not that different from what we already had.' But when an epidemic of groundnut rosette disease came along in 2001, they said, 'Hey, these new varieties are all we have left – the rest were wiped out!'

Journey to the East

The CRS office in Bacau, Timor-Leste.

A similar partnership is building in the world's newest country: East Timor, or Timor-Leste as it is now known. The Australian Centre for International Agricultural Research (ACIAR) was charged with the profoundly difficult job of rekindling agriculture after the terrible violence that followed Timor-Leste's independence in 1999. ACIAR called the new project Seeds of Life.

ICRISAT, along with four other CGIAR centers and two NGOs, was invited to participate. One of the NGOs was, inevitably, CRS. Groundnut trials are under way in four different ecological locations in Timor-Leste, and ICRISAT groundnut varieties are proving far more productive than the local material.

Handshakes are better than treaties

Partnerships are crucial to success in any agricultural enterprise. When responsibilities are shared, things get done better and quicker. Together, sincere partners can increase both the scale and the scope of activities, increase cost effectiveness, create a demand for services, increase accountability and increase the likelihood of making an impact.

All too often, the word *partnership* is misused in agricultural development. Frequently, they are no more than 'arranged marriages' set up to satisfy donor funding requirements. ICRISAT is proud to be part of several genuine partnerships – relationships where partners achieve a common goal. CRS is such a partner.

Dr Dar presenting a copy of a joint CRS/ICRISAT publication to Mr Alex Mathew, CRS Hyderabad.

And nothing is on paper. Handshake agreements are after all the best. ♦

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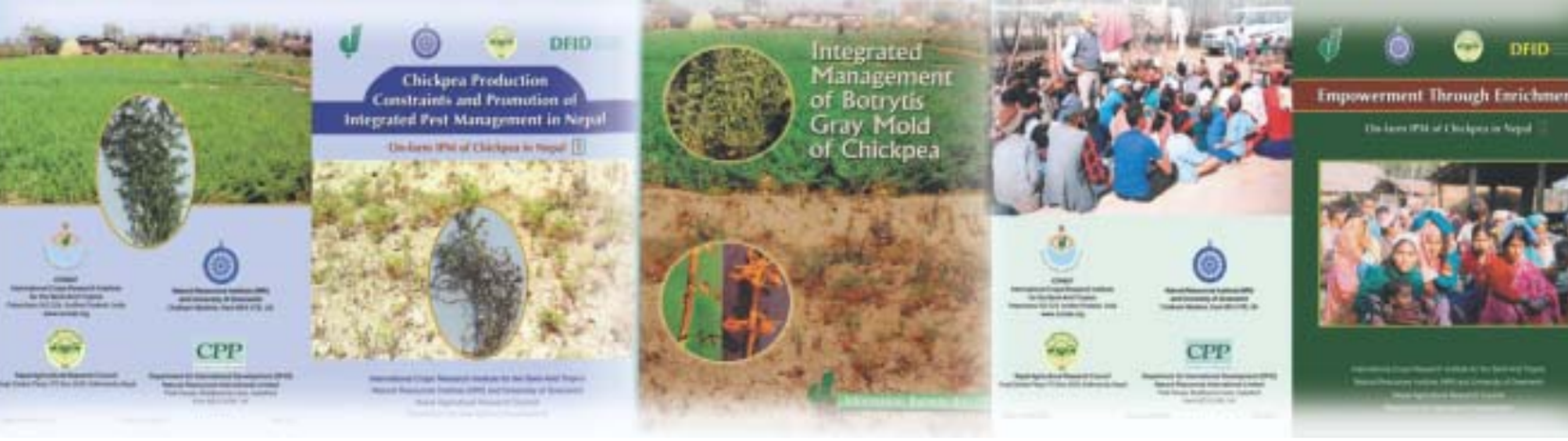

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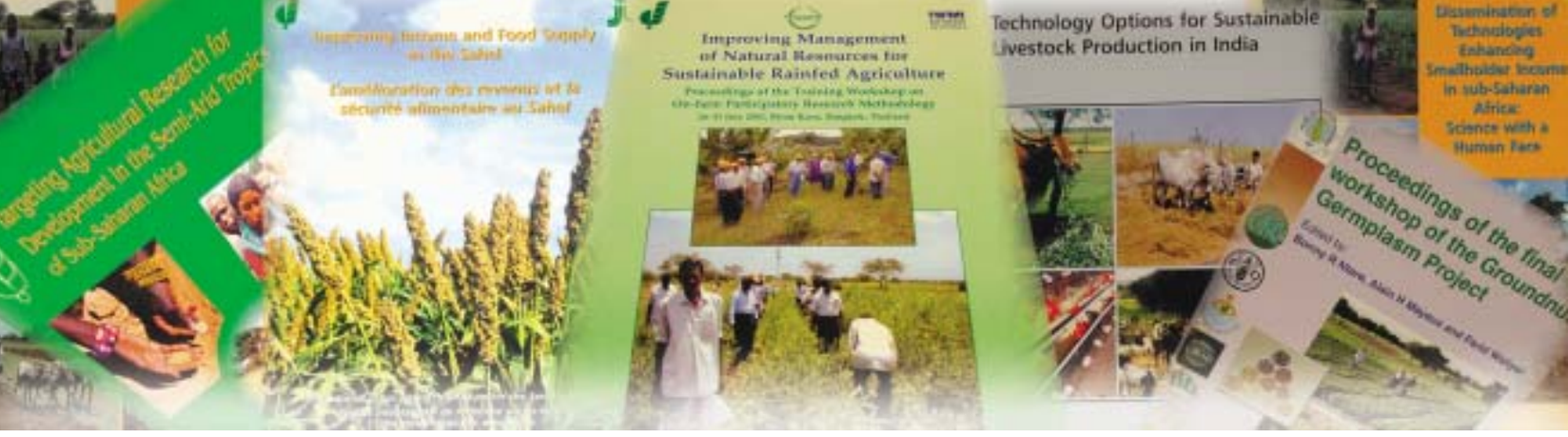

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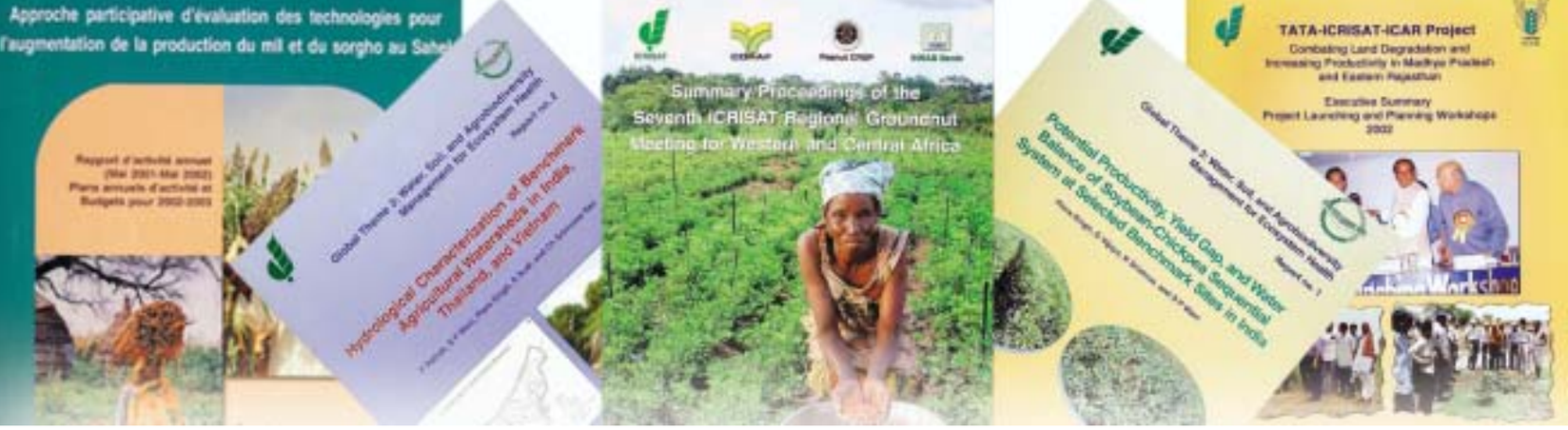

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Development Investor Partnerships: Targeted Projects

Development investors supplement the CGIAR's core support to carry out targeted projects on subjects of particular interest

Donor	Project	Collaborators
Asian Development Bank	Improving management of natural resources for sustainable rainfed agriculture	International Board for Soil Research and Management (IBSRAM), Central Research Institute for Dryland Agriculture (CRIDA), Jawaharlal Nehru Krishi Vishwa Vidyalaya, Dr Panjabrao Deshmukh Krishi Vidyapeeth, Marathwada Agricultural University, BAIF Development Research Foundation, India; Field Crops Research Institute, Khon Kaen Field Crops Research Centre, Department of Land Development, Thailand; Ministry of Agriculture and Rural Development, Vietnam; Vietnam Agricultural Science Institute, Vietnam
Australia	Study on rapid crop improvement for poor farmers in the Seeds of Life – East Timor	NARS of Bangladesh, China, India, Pakistan, Vietnam; Australian Center for International Agriculture Research (ACIAR), Catholic Relief Services, World Vision International, IRRI, CIMMYT, CIAT, CIP, Executive Government of East Timor (EGOET)
	Selection of peanut varieties with low aflatoxin risk	ACIAR, Australia; Farming Systems Institute, Queensland; Department of Primary Industries, Australia; Acharya NG Ranga Agricultural University, India
	Support towards publication of sorghum tissue culture and genetic engineering	Indian Council of Agricultural Research, India; Andhra Pradesh-Netherlands Biotechnology Project, Hyderabad, India
	Support towards publication of impact of sorghum and chickpea in Australia	ACIAR, Australia; Muresk Institute, Australia
	Support towards publication of impact evaluation of pigeonpea as green manure for sugarcane in Thailand	Department of Agriculture, Thailand; Kasetsart University, Thailand; ACIAR, Australia
	Marketing, utilization and commercialization of Stylosanthes	Commonwealth Scientific and Industrial Research Organization (CSIRO), Australia; Indian Grasslands and Forage Research Institute (IGFRI), India; Chinese Academy of Tropical Agricultural Sciences (CATAS), China; Empresa Brasileira de Pesquisa Agropecuaria (Embrapa), Brazil.
	More efficient breeding of drought-resistant peanuts in India and Australia	ACIAR, Australia; ICAR, India; Queensland Department of Primary Industries, CSIRO, Australian National University, Peanut Company of Australia, Australia
	Identification of *helicoverpa* resistance in wild species of chickpea	CSIRO Entomology, Center for Mediterranean Agricultural Research, Australia
	Improving yield and economic viability of peanut production in Papua New Guinea and Australia using integrated management and modeling approaches	ACIAR, Australia; Queensland Department of Primary Industries, Australia; Turkai Industries, Papua New Guinea; National Agricultural Research Institute, Papua New Guinea
	Integrated management of Botrytis grey mold of chickpea in Bangladesh and Australia	ACIAR, Australia; The University of Western Australia, Australia; The University of Melbourne, Australia; NSW Agriculture, Australia; Bangladesh Agricultural Research Institute, Bangladesh; NGOs, Bangladesh
Belgium	Towards sustainability of groundnut and cereal production in West Africa: Management of peanut clump virus	Université Catholique de Louvain, Belgium; Institut d'etudes et de recherche agricoles (INERA), Burkina Faso; Scottish Crop Research Institute, UK
	Improved livelihoods in the Sahel through the development and implementation of household level bio-economic decision support systems	Université Catholique de Louvain, Belgium; Institut National de Recherche Agronomique du Niger (INRAN), Niger; ILRI, Niger; Agrhymet, Niger; ACMAD, Niger; AQUADEV, Niger; FAO, Niger; CRESA, Niger; MOORIBEN, Niger
Canada	Desert margins initiative (Africa)	NARS and NGOs of Burkina Faso, Kenya and Botswana
	Improving income of farmers in eastern Africa through increased chickpea yields	University of Saskatchewan, Canada; NARS in Kenya, Tanzania and Ethiopia
	Market garden in the Sahel: fruit-trees and vegetables for land regeneration and management	International Program for Arid Land Crops (IPALAC), Israel, Agrhymet, Niger; IER, Mali; INERA, Burkina Faso; INRAN-Niger; ISRA, Senegal
	Support for the international workshop on *Biological nitrogen fixation crop productivity, enhanced human health and sustained soil fertility*	CIAT-TSBF, ICARDA, IITA, ICRAF, NARS in India, Vietnam, Brazil, Ethiopia, Algeria, South Africa, Ghana, Philippines, Morocco, Zimbabwe, Bangladesh, Syria and Egypt; FAO, IAEA, MIRCEN, AVERDC, ARIs in USA, France, Japan, Russia, Germany, Spain, UK, Netherlands; APAARI, CORAF/WECARD, ASARECA, FARA, IDRC, DFID, IFS, USAID, Noble Foundation
	Screening for resistance to *Ascochyta* blight	Agriculture Environmental Renewal Canada (AERC) Inc, Canada

Donor	Project	Collaborators
CFC	Conservation, evaluation and dissemination of groundnut germplasm and foundation seed production and distribution for the West African region	CIRAD, France; NARS of Senegal, Burkina Faso, Niger, Nigeria
	Expert meeting on utilization of regional germplasm in the improvement of sorghum and pearl millet and improved post-harvest technologies	NARS of Mali, Burkina Faso, Nigeria, Niger; INTSORMIL, CIRAD, World Vision, Winrock, SG2000, FAO, CFC
Denmark	Breeding program for sorghum and millet	NARS of Eritrea
	Kenya-Eritrea sorghum and millet seed initiative	Danida, Denmark; Ministry of Agriculture, Eritrea
	Raising income of poor farmers: Enhancing pigeonpea productivity and profitability in eastern Africa	Royal Veterinary and Agricultural University (KVL), Denmark; Kenya Agricultural Research Institute (KARI), Kenya; Ilonga Agricultural Research Institute, Tanzania; Tropical Pesticide Research Institute (TPRI), Tanzania; National Agricultural Research Organization (NARO), Uganda
	Pigeonpea-based maize production in semi-arid eastern and southern Africa	Royal Veterinary and Agricultural University (KVL), Denmark; Center for Development Research, Denmark; Ilonga Agricultural Research Institute, Tanzania; NARS of Malawi, Tanzania, Niger, Zimbabwe, Kenya
European Union	CLIMAG-West Africa – A network for: harmonization of climate prediction for mitigation of global change impact in Sudano-Sahelian West Africa	Applied Meteorology Foundation (FMA), Italy; International Research Institute for Climate Prediction (IRI), USA; Regional Center for Training and Application in Agricultural Meteorology and Operational Hydrology (AGRHYMET), Niger; African Center of Meteorological Applications of Development (ACMAD), Niger; Malian Meteorological Service (Meteo-Mali), Institut d'Economie Rurale (IER), Mali; World Meteorological Organization (WMO), Switzerland; Global Change System for Analysis, Research and Training (START), USA; Institut du Sahel (INSAH), Mali; Conseil National de la Recherche Scientifique et Tecnologique (CNRST), Mali
FAO	Integrated soil and nutrient management and conservation for farmer field schools	University of Zimbabwe, Zimbabwe; Department of Agricultural Technical and Extension Services (AGRITEX), Zimbabwe; Sorghum and Millet Improvement Program (SMIP)
	To assist in the development of a framework on crop and crop-associated biodiversity and identification of a country-driven project on crop and crop-associated biodiversity	FAO
	Planning grant to initiate the preparatory work for the RAPS WID regional conference on *Rural Women in Knowledge Society*	FAO
	For organizing the regional consultation on *Rural Women in Knowledge Society*	FAO
	APAARI support for coordination of the cereals and legumes Asia network	NARS of Bangladesh, China, India, Indonesia, Myanmar, Nepal, Pakistan, the Philippines, Thailand, Sri Lanka, Vietnam, NGOs and private sector
	Impact of seed trade liberalization on access to and exchange of agro-biodiversity	FAO, Michigan State University, USA
	Support for the long-term conservation of small millets genetic resources at ICRISAT	FAO, NBPGR, India
	Applied screening of soil and water management practices as a precursor to farmer field schools in Dodoma Rural, Tanzania	FAO, NGOs in Tanzania
	Assess the impact of the year 2000 floods on agro-biodiversity in Mozambique	FAO, USAID, NARS-Mozambique
France	Transgenic sorghum to control stem borer	International Cooperation Center for Agronomic Research for Development (CIRAD), France
	Genetic transformation of pigeonpea to evaluate insecticidal genes for the management of resistance to legume podborer, *Helicoverpa armigera*	International Cooperation Center for Agronomic Research for Development (CIRAD), France
	Financial support for organization of a regional workshop for the preparation of a regional agricultural research project *Expanding commercial cropping options for smallholders in the semi-arid areas of SADC*	USAID, NARS, NGOs, private sector seed companies, farmers in southern Africa

Donor	Project	Collaborators
Germany	Promotion of legume cultivation in Malawi, Mozambique, Zimbabwe and Zambia – phase V	NARS in Malawi, Mozambique, Zimbabwe and Zambia
	Evaluating ICRISAT's breeding strategy for pearl millet with farmers in West and Central Africa	Advisory Service on Agricultural Research for Development (BEAF), Germany; University of Hohenheim, Germany
	Support for the workshop on *Facilitating the improvement of pearl millet in West Africa through conventional plant breeding, farmers' participation, and comparative genomic strategies*	NARS - Mali, Niger, Senegal, Burkina Faso, Nigeria; Cornell University, USA; Kansas State University, USA; Oregon State University, USA; University of Georgia, USA; University of Hohenheim, Germany; University of Bangor, UK; IRD-France, Wageningen University, The Netherlands
IFAD	Farmer participatory testing of technologies to increase sorghum and pearl millet production in the Sahel	NARS in Burkina Faso, Ghana, Mali, Niger and Nigeria
	Farmer participatory improvement of grain legumes in rainfed Asia	China: OCRI (CAAS), CRI (GAAS), YAAS, GxAAS, RIRI/ CAF; India: NRCG, NCIPM and IIPR (ICAR), ANGRAU, GAU, and RAU (SAUs), RDT (NGO), CTDP (IFAD Dev Proj); Nepal: NARC, FORWARD and LI-BIRD (NGOs), DoA (IFAD Dev Proj); Vietnam: VASI, NIIP, OPI
IFAD and GM of UNCCD	Drafting workshop for the pre-proposal of *Desertification, drought, poverty and agriculture (DDPA): Building livelihoods, saving lands* held at ICARDA, Aleppo, Syria, 4-8 August 2002	CERAAS, Senegal; ICAR, India; INSAH, Mali; ASARECA, Uganda; James Cook University, Australia; CAZS, UK; Desert*Net, Germany; EARS, Netherlands; ICBA, UAE; IPALAC, Israel; The International Research Institute for Climate Prediction, USA; Wageningen University, Netherlands; ICARDA, ICRAF, IFPRI, IFAD, GM of UNCCD, ILRI, TSBF-CIAT, The Desert Research Foundation of Namibia, Namibia; IUCN, Switzerland
Inter-American Development Bank	A research and network strategy for sustainable sorghum production systems for Latin America	NARS of Latin America, CIAT
Iran	Joint collaborative projects and receipt of germplasm for the improvement of pulses production in the arid regions of Iran	NARS of Iran
	Training activities for Iranians at ICRISAT, Patancheru	Acharya NG Ranga Agricultural University, Central Research Institute for Dryland Agriculture (CRIDA), India
India	Identifying systems for carbon sequestration and increased productivity in semi-arid tropical environments	Central Research Institute for Dryland Agriculture (CRIDA), India; Indian Institute of Soil Science, India; National Bureau of Soil Science and Land Use Planning (NBSS&LUP), India
	Aflatoxin contamination in groundnut: mapping and management in Gujarat, Andhra Pradesh and adjoining areas	National Research Center for Groundnut, India; Gujarat Agricultural University, India
	Organic matter recyling and enrichment	Punjab Agricultural University, India; Indian Council of Agricultural Research, India; Haryana Agricultural University, India; Benaras Hindu University, India; GB Pant University of Agriculture and Technology, India
	An integrated approach to control stem necrosis disease of groundnut	National Research Center for Groundnut (NRCG), Jungadh; National Bureau of Plant Genetic Resources (NBPGR), Hyderabad; Regional Research Station, Acharya NG Ranga Agricultural University (ANGRAU), Kadiri
	Molecular marker development, tagging of chickpea against abiotic stresses and cloning of R Gene against fusarium wilt	National Center for Plant Genome Research (NCPGR), India, Department of Biotechnology, Government of India, Jawaharlal Nehru University (JNU), New Delhi, India
	Technical support in developing model watersheds by ITDA in Adilabad district of Andhra Pradesh	International Fund for Agricultural Development (IFAD), Italy; Integrated Tribal Development Agency, Government of Andhra Pradesh, India
	APRLP-ICRISAT capacity building and networking of partners – in watershed program support to APRLP	NGOs, CBOs in AP, India; Govt of AP, India; CRIDA, India; ANGRAU, India; NRSA, India
	Post-doctoral fellowship for Dr B Venkatesh Bhat	Indian Institute of Science, Bangalore, India
Italy	Facilitate the identification and design process of challenge programs	CGIAR
Japan	Post-doctoral fellowship to Dr K Hayashi for working with ICRISAT at Niamey	NARS in West and Central Africa
Kenya	Increased production of pigeonpea: Farmer participatory screening, evaluation, production and marketing in semi-arid eastern Kenya to increase production	World Bank, Kenya Agricultural Research Institute (KARI), Kenya
The Netherlands	Evolving transgenic sorghum with suitable Bt gene constructs, resistant to stemborer	National Research Center for Sorghum, India; National Research Center on Plant Biotechnology, India
	Development of disease resistant transgenic pigeonpea	Osmania University, India

Donor	Project	Collaborators
	Genetic enhancement of pigeonpea (*Cajanus Cajan* [L.] Millspaugh) for pest resistance through interspecific hybridization	Osmania University, India; Institute of Public Enterprise, India
Norway	Sustainable natural resource management options to combat land degradation in sub-Saharan Africa	NARS of Burkina Faso, Botswana, Kenya, Mali, Niger, Namibia, Senegal, Zimbabwe and South Africa, ASARECA, IGADD, SACCAR, INSAH, IBSRAM, ICARDA, ICRAF, IFDC, IFPRI, ILRI, IPGRI, UNDP, UNEP, CIRAD, IH, ITE, IRD
OPEC	Technological empowerment of poor groundnut farmers in Asia: A step towards better rural economy	Asian NARS
PLAN International	Groundnut project in Malawi	NARS and NGOs of Malawi
	Support for the improvement of nutritional status of PLAN sponsored children and their families and family income	NARS and NGOs of Zambia
The Rockefeller Foundation	Field phenotyping of rice mapping populations and exploitation of synteny between rice and sorghum, for improving field response to drought stress	Tamil Nadu Agricultural University, India; University of Agricultural Sciences-Bangalore, India; Indian National Rice Biotechnology Network, India
	IER-INERA-ICRISAT collaborative project: Guinea sorghum hybrids: Bringing the benefits of hybrid technology to staple crops of sub-Saharan Africa	Institut D'Economie Rurale (IER), Mali Institut de l'Environnement et de Recherches Agricoles (INERA), Burkina Faso
	New approaches for technology, policy and institutions for attaining sustainable improvements in soil fertility management in drought prone areas of Zimbabwe	Department of Agricultural Technical and Extension Services (AGRITEX), Zimbabwe; FAO, Italy; Department of Research and Specialist Services, Zimbabwe; University of Zimbabwe, Zimbabwe; Care International, Zimbabwe
	To conduct workshop and training course on state-of-the-art field screening of cereals, with emphasis on rice for drought tolerance	Tamil Nadu Agricultural University, India; University of Agricultural Sciences-Bangalore, India; Indian National Rice Biotechnology Network, India
	Conference on rural livelihoods and poverty reduction policies in Kenya, Malawi, Tanzania and Uganda	NARS and NGOs of Kenya, Malawi, Tanzania and Uganda; Cornell University, USA; Institute of Development Studies, UK
	Convening a workshop to plan research to improve pearl millet in West Africa through conventional breeding, comparative genomics and farmer participation	NARS in Mali, Niger, Senegal, Burkina Faso, Nigeria, Cornell University, USA; Kansas State University, USA; Oregon State University, USA; University of Georgia, USA; University of Hohenheim, Germany; University of Bangor, UK; IRD-France; Wageningen University, Netherlands; GTZ, Germany
	Market, technology and institutional innovations for improving food security and incomes of poor farmers growing grain legumes in Malawi and Mozambique	Department of Agricultural Research and Technical Services, Malawi; Instituto Nacional de Investigação Agronómica, Mozambique; LegumeTech, Malawi; Kenya Agricultural Commodity Exchange, Kenya.
Switzerland	West and Central Africa millet research network (WCAMRN/ROCAFREMI)	National extension workers, NGOs and farmers, INTSORMIL
Switzerland and India	Enhancing tolerance of chickpea to drought, freezing and low temperature through genetic engineering with the CodA and P5CSF-129A Genes	University of Delhi, India; Department of Biotechnology, Government of India; Laboratory of Bioenergetics, University of Geneva, Switzerland; Institute of Biotechnology, Switzerland
	Effects of transgenic insect-resistant chickpea plants on non-target insects	Institute of Biotechnology, Switzerland
UK	Management of key insect pests of sorghum in southern and eastern Africa: Developing IPM approaches with expert panels	Center for Agriculture and Biosciences International (CABI), UK; Natural Resources Institute (NRI), UK; Kenya Agricultural Research Institute (KARI), Kenya
	Finger millet blast in East Africa: Pathogen diversity and disease management strategies	DFIC/CPP, Horticulture Research International, UK; NARS of Kenya and Uganda
	Will women farmers invest in improving their soil fertility management? Participatory experimentation in a risky environment	Silsoe Research Institute, UK; NARS and NGOs in Malawi and Zimbabwe
	Modeling the risk of introducing transgenics into traditional cropping systems: A case study with pigeonpea	University of Birmingham, UK; National Bureau of Plant Genetic Resources, India
	Genetic enhancement of feed quality and quantity in sorghum and millet	International Livestock Research Institute, UK; Indian NARS, Institute of Grassland and Environmental Research, UK; Rowett Research Institute
	Evaluation of the effects of plant diseases on the yield and nutritive value of crop residues used for peri-urban dairy production on the Deccan Plateau in India	Natural Resources Institute, UK; International Livestock Research Institute, Kenya; Acharya NG Ranga Agricultural University, India; University of Greenwich, UK

Donor	Project	Collaborators
	Contiguous segment substitution lines: New tool for elite pearl millet hybrid parental lines enhancement	Center for Arid Zone Studies, UK; All-India Coordinated Pearl Millet Improvement Project, India; Indian Agricultural Research Institute, India
	Use of molecular markers to improve terminal drought tolerance in pearl millet	Institute of Grassland and Environmental Research, UK
	Marker-assisted improvement of pearl millet downy mildew resistance in elite hybrid parental lines for Africa and Asia	CCS Haryana Agricultural University, India; Tamil Nadu Agricultural University, India; Center for Arid Zone Studies, UK; All-India Coordinated Pearl Millet Improvement Project, India; Central Arid Zone Research Institute, India
	Indo-British collaborative project – Participatory varietal selection in Rabi sorghum	Center for Arid Zone Studies, UK; and NARS in India
	Characterization of the causal virus of pigeonpea sterility mosaic disease: A further step towards attaining sustainability of pigeonpea production in the Indian subcontinent (Phase III)	Natural Resources Institute, UK; Scottish Crop Research Institute, UK; University of Agricultural Sciences, India; Sri Venkateswara University, India
	Groundnut rosette disease management	Natural Resources Institute, UK; University of Georgia, USA; NARS of Uganda and Malawi
	Optimizing institutional arrangements for demand driven post-harvest research, delivery, uptake and impact on the livelihoods of the poor through public and private sector partnerships	Natural Resources Institute, UK; University of Strathclyde, UK; National Center for Agricultural Economics and Policy Research, India
	Rapid generation advance in photoperiod sensitive sorghum	University of Wales, UK
	Interaction between on-farm seed priming, nodulation and disease incidence in chickpea	University of Wales, UK; NARS in Bangladesh
	Rapid generation of chickpea population for farmer participatory selection	University of Wales, UK
	Promotion of chickpea following rainfed rice in the Barind area of Bangladesh	University of Wales, UK; Peoples Resource Oriented Voluntary Association, Bangladesh; Bangladesh Agricultural Research Institute, Bangladesh
	Promotion of rainfed rabi cropping in rice fallows of India and Nepal: Pilot phase	University of Wales, UK; NARS in India and Bangladesh
	Promotion of rainfed rabi cropping in rice fallows of eastern India and Nepal: Phase 2	Center for Arid Zone Studies, UK; Catholic Relief Services, India; NARS, India; Forum for Rural Welfare and Agricultural Reform for Development, Nepal
	Seed priming for pigeonpea in semi-arid high elevation areas of Kenya	University of Wales, UK; NARS in Kenya
	Promoting the adoption of the improved disease and pest management technologies in chickpea by poor farmers in mid-hills and hill side cropping systems in Nepal	Natural Resources Institute, UK; Nepal Agricultural Research Council, Nepal; Natural Resources Institute, UK
	Strategies for reducing aflatoxin levels in groundnut-based foods and feeds in India: A step towards improving health of humans and livestock	Natural Resources International Ltd, UK; University of Reading, UK; The Queens University of Belfast, UK; Natural Resources Institute, UK; Acharya NG Ranga Agricultural University, Hyderabad, India; Society for Transformation, Agriculture and Alternatives in Development, Hyderabad, India; Agriculture, Man, Ecology, Bangalore, India
	Convergence of agricultural, livestock improvement initiatives in watersheds – support to APRLP	NGOs, CBOs in AP, India; Govt of AP, India; CRIDA, India; ANGRAU, India; NRSA, India; DFID, India
	Re-survey Aurepalle and Dokur villages	Overseas Development Institute, UK
	Making more miracles: Exploiting marker-assisted methods for pearl millet improvement	Rajasthan Agricultural University, India; University of Mysore, India; CCS Haryana Agricultural University, India; Indian Agricultural Research Institute, India; Institute of Grassland and Environmental Research, UK; Center for Arid Zones Studies, UK
	Improvement of rainfed cropping systems in the high Barind tract of Bangladesh	University of Wales, UK; Peoples Resource Oriented Voluntary Association, Bangladesh; Bangladesh Agricultural Research Institute, Bangladesh
	Support for the workshop on *Biological nitrogen fixation*	CIAT-TSBF, ICARDA, IITA, ICRAF; NARS in India, Vietnam, Brazil, Ethiopia, Algeria, South Africa, Ghana, Philippines, Morocco, Zimbabwe, Bangladesh, Syria, Egypt; FAO, IAEA, MIRCEN, AVERDC; ARIs in USA, France, Japan, Russia, Germany, Spain, UK, The Netherlands; APAARI, CORAF/WECARD, ASARECA, FARA; IDRC, DFID, IFS, USAID, Noble Foundation

Donor	Project	Collaborators
	Informing food security policy: Using household strategies to develop sustainable intervention for rural livelihoods and poverty reduction in Suba and Bomet districts of Kenya	University of East Anglia
	Options for supporting on-farm conservation in eastern & southern Africa	GTZ, Germany; ODI, UK; NARS in Ethiopia and Zimbabwe
UN/FAO/Italy	Support for associate professional officer (visiting research fellow, ICRISAT)	Government of Italy, NARS in Zimbabwe
UNDP and USA	Impact of ICRISAT/NARS germplasm research for sorghum, groundnut and pearl millet	Yale University, USA
UNDP	Evaluation of the project *Community-based rain water harvesting in the drought affected areas in Bolangir and Nuapada districts*	Government of Orissa, India; NGOs
UNEP	Environmental assessment, information and early warning (support to Africa) – desert margins program (DMP) development	NARS of Burkina Faso, Botswana, Kenya, Mali, Niger, Namibia, Senegal, Zimbabwe and South Africa; ASARECA, IGADD, SACCAR, INSAH, IBSRAM, ICARDA, ICRAF, IFDC, IFPRI, ILRI, IPGRI, UNDP, UNEP, CIRAD, IH, ITE, IRD
UNEP/GEF	Desert margins program development	INERA, Burkina Faso; INRAN-Niger; ISRA, Senegal; KARI, Kenya; Botswana College of Agriculture, Zimbabwe; Desert Research Foundation, Namibia; Potchefstroom University for CHE, South Africa; Agricultural Research Council, Zimbabwe; ICRAF, IFDC, IFPRI, ILRI, IPGRI, UNDP, UNEP, TSBF, CIRAD-France; CEH-UK, IRD-France
USA	Seeds for freedom: Angola agricultural recovery program – An international, world vision/CGIAR plan for the rapid recovery of food production systems in Angola	USAID/OFDA, CIAT, CIMMYT, IITA, ISNAR, CIP, World Vision, NARS of Angola, in-country NGOs and farmers
	Improving the efficiency of emergency seed supply: Linking relief seed distribution to trade and market development	USAID/OFDA, African Seed Trade Association (AFSTA); American Seed Trade Association (ASTA); Cooperative League of the United States of America (CLUSA); Direcção de Economica (DE); Direcção Nacional de Agricultura (DINA); Direcção Provincial de Agricultura e Pescas (DPAP); International Fertilizer Development Center (IFDC); Instituto Nacional de Investigaçao Agronómica (INIA); Ministério da Agricultural e Desenvolvimento Rurais (MADER); Michigan State University (MSU); National Agricultural Research System (NARS); Non-Governmental Organization (NGO); Overseas Development Institute (ODI); Programa Nacional de Desenvolvimento Agrária (PROAGRI); Southern Africa Development Community (SADC); Sorghum and Millet Improvement Project (SMIP); Serviço National de Sementes (SNS); Special Program for African Agricultural Research (SPAAR); Sub-Saharan Africa Seed Initiative (SSASI)
	Strengthening national agricultural research systems in Africa through collaborative research networks	USAID, NARS of participating countries, NGOs, and private sector
	Agricultural research for development of SAT: A new vision and strategy	USAID Africa Bureau, NARS in Africa and Asia
	Regional sorghum and millet research project for southern Africa	USAID, NARS, NGOs, private sector seed companies, farmers
	Population structure and genetic diversity of *Sclerospora graminicola*: Keys to stable production of pearl millet	USAID, Texas A&M University (USA)
	Fulfilling seed requirements in famine threatened areas in West Africa: A need for emergency seed distribution	USAID/OFDA, NARS of West Africa
	Rural prosperity is nation's economic stability: A partnership approach to attain sustainable production of groundnut and pigeonpea in small holder agriculture for quality diet, household food security, and poverty alleviation in Malawi	USAID, Ministry of Agriculture and Irrigation, Malawi; NARS, NGOS and farmers in Malawi
	Strategic marketing of sorghum and millet food products in West and southern Africa	University of Illinois, USA; NARS in West and southern Africa
	Seeds for survival: Increasing the effectiveness of emergency seed aid programs in enhancing seed security in the Greater Horn of Africa	USAID/OFDA, Catholic Relief Services, Uganda; NARS and NGOs in Uganda and Sudan
	Quantifying yield gaps and abiotic stresses in soybean and groundnut-based rainfed production systems	USAID, University of Georgia, USA; SANREM-CRSP, USA

Donor	Project	Collaborators
	Strategies for improving the adoption of seed and fertilizer in Africa	USAID, Michigan State University, USA; NARS in Africa
	Improvement of *striga* resistance of Tanzania landrace sorghum varieties	USAID; Purdue University, USA; NARS in Tanzania
	Enhanced collaboration on genetic resources and the use of wild relatives in chickpeas	USAID, Washington State University (USA)
	Risk assessment and management of grain mold and fumonisins to enhance utilization, profitability and food/feed safety of sorghum grain	USAID, Iowa State University, USA
	Spatial modeling of regional soil water balance from remotely sensed data and indigenous knowledge to predict crop stress and mitigate food deficit in Niger	USAID, Texas A&M University System, USA
	Diversity in the sorghum ergot pathogen in India	USDA, Foreign Disease and Weed Science Research Unit, USDA, USA; National Research Center for Sorghum, India
	Support for regional workshops and publications	University of Georgia, Peanut CRSP, NARS in Africa
	Will climate forecasting and new knowledge tools help resource-poor farmers from debt to prosperity? Farmers' participatory approach to manage climate variability	International Research Institute for Climate Prediction, USA; Acharya NG Agricultural University, India; CSIRO, Australia
	Bytes for bites: translating climate forecasts into enhanced food security for the Sahel	IER, Mali; International Research Institute for Climate Prediction, USA; University of Sherbrooke, Canada; Environmental Analysis and Remote Sensing, Netherlands; CIRAD, France; University of Florida, USA
	More bang for the research buck: Raising farmers' incomes through use of profitable grain legume technologies and better linkages to markets	Catholic Relief Services, Tanzania
	Fertilizer micro-dosing for small farmer prosperity in the Sahel	Sasakawa Global 2000, Mali; Winrock International; INERA, Burkina Faso; FAO, Niger
	To promote and expand the production of drought tolerant small grains and legume seed by smallholder farmers contracted to Seed Co Pvt Ltd	The LEAD Program of USAID, Zimbabwe; Seed Company Pvt Ltd, Zimbabwe
	Promoting growth in Malawi's groundnut and pigeonpea trade through technology and market improvement	NARS, Malawi
	Agricultural research for development of SAT: A new vision and strategy	Africa Bureau of USAID, NARS in Africa and Asia
Consortia of donors (via CGIAR Systemwide Programs)	Optimizing seed water content to improve longevity in ex-situ genebanks	IPGRI, University of Reading (UK), National Seed Storage Laboratory (USA), National Genebank of China
	Improving crop-livestock productivity through efficient nutrient management in mixed farming systems of semi-arid West Africa	ILRI, IER, INERA, INRAN, ISRA, IFDC
	CGIAR gender and diversity program: Support to strengthen performance of teams partnership, in-house cultural orientation program and to promote women's leadership and advancement	ICRAF and other CGIAR Centers
	Research activities on groundnut and on management of drought in chickpea, targeted to the central Asia and the Caucasus (CAC) region	ICARDA
	Further improving the quality and range of data available on ICRISAT's genetic resources collections (SINGER Phase II/2)	IPGRI
	Increasing livestock productivity in mixed crop-livestock farming systems in South Asia	ILRI
	Assessment of diversity in indigenous animal genetic resources	ILRI
	Scaling up participatory plant breeding: Sustainable seed delivery systems for meeting farmers' needs for diversity and varietal change over time	CIAT/PRGA, Institut d'Economic Rurale du Mali (IER), Mali; Universite du Mali, Mali; Point Sud, Research Centre on Local Knowledge, Mali; Association Villageoise de Gonsolo, Mali; Compagnie Malienne du Developpement des Textiles (CMDT), Mali

Donor	Project	Collaborators
	Support for workshop on: Linking Logics II: A joint venture between PRGA, SWNM, ICRISAT and CIMMYT to further explore linkages between farmer participatory research approaches and computer-based simulation modeling to increase crop productivity at smallholder level	CIAT/PRGA, CIMMYT, NARS in Zimbabwe, South Africa, Kenya, Burkina Faso, Niger, Uganda, Côte d'Ivoire, United States of America, Australia, Laos and New Zealand
	System-wide program on IPM - Pilot Project on IPM in the Sahelian zone	IITA, Institut d'Economic Rurale du Mali (IER), Mali; Institut d'etudes et de recherche agricoles (INERA), Burkina Faso
	Factors influencing agricultural diversification in India: Implications for the poor	IFPRI
	Crop-livestock system in Mali	ICRISAT, IITA, ILRI, IFDC
	Revision of intellectual property management plans of the McKnight Foundation's Grantees of the Collaborative Crop Research Program	ISNAR
World Bank	Sustainable natural resource management options to combat land degradation in sub-Saharan Africa	NARS of Burkina Faso, Botswana, Kenya, Mali, Niger, Namibia, Senegal, Zimbabwe and South Africa; ASARECA, IGADD, SACCAR, INSAH, IBSRAM, ICARDA, ICRAF, IFDC, IFPRI, ILRI, IPGRI, UNDP, UNEP, CIRAD, IH, ITE, IRD
	Development market place: Integrated family drip-irrigation systems for small holders	INRAN-Niger; NARS in Niger; IPALAC, Israel
	Preservation of wild species of *Arachis* in South America	CENARGEN (Brazil)
OTHERS		
Sir Dorabji Tata Trust	Combating land degradation and increasing productivity in Madhya Pradesh and eastern Rajasthan	NARS in India
Agriculture, Man, Ecology	Crop residues and farm-waste for low cash-input agriculture	Punjab Agricultural University, India
Sehgal Family Foundation	Genetic enhancement of pearl millet for downy mildew resistance and fellowships to students for research on sorghum	NARS in India
CARE International	Seed distribution and production project (SDPP) in lower Shabelle region of Somalia	Care International, USAID
Catholic Relief Services	ICRISAT-CRS collaborative project in Tharaka and Mbeere districts	Catholic Relief Services, USAID, NARS in Kenya
CF Bentley	Support for science with a human face	CGIAR
UNA Consortium	Support to UNA's Integrated Pest Management in Somalia in the development of a training module on stem and stalk borers	Farmers and NGOs in Somalia. Kenya Agricultural Research Institute, Kenya; CABI, Kenya
Seed Companies	Diversification of sorghum hybrid parents for Asia	Advanta India Ltd, Ganga Kaveri Seeds Ltd, Paras Extra Growth Seeds Ltd, J K Industries Ltd, Mahendra Hybrid Seeds Co Ltd, Nuziveedu Seeds Company Ltd, Pro-Agro Seed Co Ltd, Pioneer Hi-bred International, Monsanto Technologies India Ltd, Kanchan Ganga Seed Company Pvt Ltd, Misr Hytech Seed International, Vibha Agrotech Ltd
Seed Companies	Diversification of pearl millet hybrid parents	Advanta India Ltd, Ganga Kaveri Seeds Ltd, Paras Extra Growth Seeds Ltd, J K Industries Ltd, Mahendra Hybrid Seeds Co Ltd, New Nandi Seeds Corprn, Nuziveedu Seeds Ltd, Pro-Agro Seed Co Ltd, Pioneer Hi-bred International, Bioseed Research India Pvt Ltd, Kanchan Ganga Seed Co Pvt Ltd, Rasi Seeds Ltd, Syngenta India Ltd, Maharashtra State Seeds Corporation Ltd, Vibha Agrotech Ltd
JK Agrigenetics, JK Industries Ltd	Research and development for breeding new high-yielding disease resistant pure lines and hybrids in pigeonpea	Private Sector Seed Companies, India
Maharashtra Hybrid Seeds Company (MAHYCO)	Development of cytoplasmic male sterility in pigeonpea	NARS in India
MAHYCO Research Foundation	Management of tospoviruses in selected crops and strategies for management of tobacco streak virus	Mahyco Research Foundation, India; Sri Venkateswara University, India

Attributed support for core programs from the Commission of the European Communities (CEC), Japan, France, South Africa and UK is not listed but is included in the Financial Summary

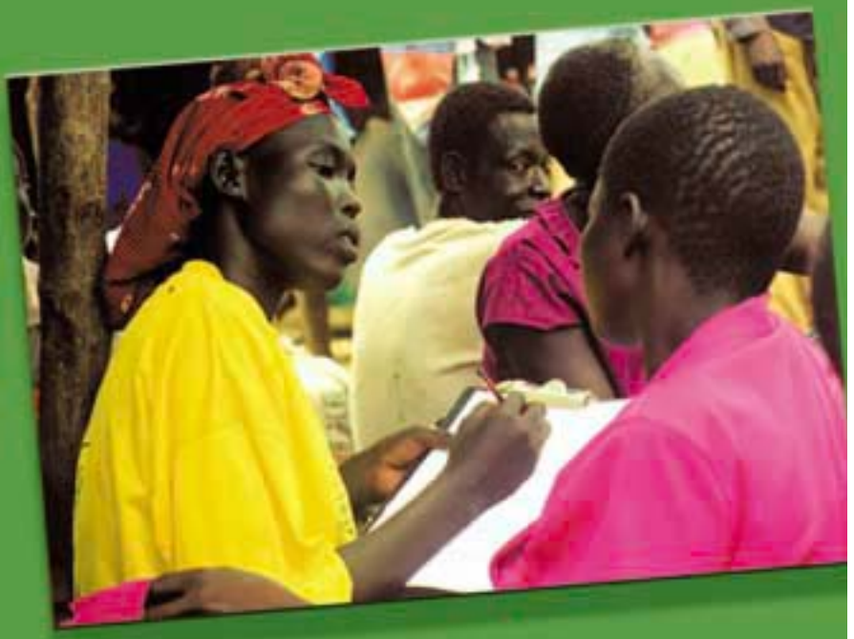
Research Scholars

Name	Country of origin	Degree	Topic
Completed during 2002			
BU Singh	India	PhD	Host plant resistance to shoot fly, stem borer or head bug in sorghum
Kamala Venkateswaran	India	PhD	Genetic and molecular characterization of wild and cultivated species of sorghum for transferring resistance to biotic stresses
B Jayanand	India	PhD	Tissue culture and genetic transformation in chickpea
D Harsha Vardhan	India	PhD	Biotechnological approaches for development of disease resistance in sorghum
A Sunita Daniel	India	PhD	Groundnut transformation for GRAV resistance by using coat protein and satellite genes
K Anupama	India	PhD	Genetic and molecular markers in chickpea
Naveenkumar Kulkarni	India	PhD	Pigeonpea sterility mosaic disease: Transmission, virus-vector relationship and identification of resistant sources
GV Naveen Sharma	India	PhD	DNA markers, microsatellites, silver staining and BSA
B Ramachandra Sarosh	India	PhD	Molecular aspects of pearl millet downy mildew resistance
Gowri M Sajjanar	India	PhD	Genetic analysis of components of resistance to shoot fly (*Atherigona soccata*) in sorghum (*Sorghum bicolor* (L.) Moench)
T Sivananda Varma	India	MSc	Identification of PCR - DNA markers associated with resistance to rust and determining their position on a genetic linkage map in groundnut
M Bhanu Priya	India	PhD	Study of tospoviruses infecting economically important crops
Boubacar K Sanogo	Mali	MSc	Evaluation de techniques de Lutte Intégrée contre le *Striga hermonthica* en milieu paysan, Dialakoroba
Mamoutou Diarra	Mali	MSc	Etude comparative de l'efficacité des test variétaux à la station et en milieu paysan
Moussa Bagayogo	Mali	Msc	Effets des pratiques culturales sur le tallage et la régulation du nombre de tiges par unité de surface dans les cultures de sorgho
Jakobus Aarnoud Riemens	The Netherlands	MSc	Effectiveness of sorghum defence mechanisms against *Striga hermonthica*
Ylva Besemer	USA/Sweden	PhD	Soil microbiology and biodiversity
Martine van Wolfswinkel	The Netherlands	MSc	Legumes and soil fertility
Dougbedji Fatondji	Niger	PhD	Organic amendment decomposition, nutrient release and nutrient uptake by millet *(Pennisetum glaucum* L. R. Br*)* in a traditional land rehabilitation technique (zai) in the Sahel
Bako Hamidine	Niger	MSc	Suivre les differents variétés améliorées testées en milieu paysan
Gaetan Gerard Otto	Belgium	MSc	Genomic variability of peanut clump virus in West Africa
Illas Djariri	Niger	MSc	Effet de l'huile de jatropha curcas sur les insectes ravageurs du Niebé
Katoumi Sirfi Maiga	Niger	MSc	Progression de l'infection par le virus du rabougrissement de l'arachide au cours de la saison
Malam Lafia Djibo	Niger	MSc	Effet de l'huile de jatropha curcas sur l'entomofaune du Niebé en stockage
Mamane Bachir Magagi	Niger	MSc	Test d'une méthode pour améliorer l'éfficacité de la fumure par parcage du bétail
Massaladji Fatima	Niger	MSc	Lutte contre le striga à l'aide du sesame
Renkin Aberdeen Chris	Belgium	MSc	Seed transmission of peanut clump virus
Rirabé Djidingar	Niger	MSc	Protection de l'environnement et amélioration des systèmes agraires
Severine Anne Françoise Henin	Belgium	MSc	Genomic variability of peanut clump virus in West Africa
Vankeerberghen Thomas	Belgium	MSc	Dynamics of infection and development of peanut clump disease
Xavier Benoit Sauvenie	Belgium	MSc	Seed transmission of peanut clump virus

Name	Country of origin	Degree	Topic
Continuing during 2002			
G Sunitha Dayal	India	PhD	Genetic transformation studies in pigeonpea
D Anitha Kumari	India	PhD	Mechanisms and diversity of resistance to *Helicoverpa* in pigeonpea
E Sreelatha	India	PhD	Stability, inheritance and mechanisms of resistance to *Helicoverpa armigera* (Hub) in chickpea
J Sailasree	India	PhD	Microbiological and molecular characterization of microorganisms for the management of *Helicoverpa armigera*
G Sujana	India	PhD	Studies on mechanisms of resistance to pod borer in wild relatives of pigeonpea (*Cajanus cajan* L.)
R Aruna	India	PhD	Wide hybridization in *Cajanus cajan* involving compatible wild spp.
D Prabhakar Reddy	India	PhD	Introgression of pod borer resistance into pigeonpea (*Cajanus cajan*) using incompatible wild relatives
B Santha	India	PhD	Tissue culture and genetic transformation of dryland cereals with emphasis on pearl millet
Ch Anuradha	India	PhD	Genetics and molecular marker studies in chickpea (*Cicer arietinum* L.)
Dev Vart	India	PhD	Genetics of cytoplasmic nuclear male sterility and molecular markers of their restorer genes in pearl millet
P Sri Lakshmi	India	PhD	Characterization of isolates of *Trichoderma* spp for their biocontrol ability against *Aspergillus flavus* in groundnut
B Padmaja	India	PhD	Identifying effective cropping systems for carbon sequestration and their effect on soil organic matter in semi-arid tropics
L Sivarama Prasad	India	PhD	Synteny analysis of rice and sorghum
H Abdullahi Nur	India	PhD	Variability in *Aspergillus flavus* and biocontrol of aflatoxin contamination in groundnut
Surinder Kumar Gulia	India	PhD	QTL mapping and marker-assisted improvement of downy mildew resistance in ICMB 89111
SV Siva Gopala Swamy	India	PhD	Pigeonpea transgenics for resistance to *Helicoverpa armigera*
V Girija Shankar	India	PhD	Bioinformation of sorghum explants using Bt and other gene constructs
D Ramgopal	India	PhD	Studies on phenotypic and molecular characterization and evaluation in *Cicer* wild species and their interspecific populations
Hameeda Bee	India	PhD	Studies on agriculturally beneficial microorganisms: Diversity and dynamics in cropping systems, contrasting for crop residues and pest management
B Pushpavathi	India	PhD	Variability of *Sclerospora graminicola*
Jonne Rodenburg	The Netherlands	PhD	Host plant defence to the parasitic plant *Striga* – its nature, effectivity, adaptability and trade-offs with yielding ability
Bongani Ncube	Zimbabwe	PhD	Legumes and soil fertility
Patricia Masikate	Zimbabwe	MPhil	Tillage and manure interactions
Helen Ncube	Zimbabwe	BSc	Manure and soil texture interactions
Joined during 2002			
P Satish Kumar	India	PhD	Marker-assisted back cross transfer of QTLs for terminal drought tolerance between elite pearl millet maintainer lines
T Nepolean	India	PhD	QTL mapping of grain and stover yield in pearl millet
G Manisha	India	PhD	Development of new PCR-based sequence specific co-dominant markers for groundnut and molecular genetic characterization of ICRISAT groundnut germplasm
Mukesh Kumar	India	PhD	Effects of cytoplasmic male sterility on expression of resistance to sorghum shoot fly
Latha Nagarajan	India	PhD	Millet biodiversity and seed systems study
Y Venkanna	India	MSc	Bioefficacy of certain new insecticides against pest complex of groundnut
D Guruva Reddy	India	MSc	Research on validation of available IPM components against groundnut pest complex in Andhra Pradesh
Kassim Coumaré	Mali	MSc	Indice de récolte et qualité paille du sorgho pour l'alimentation des ruminants
Tom van Mourik	The Netherlands	PhD	Quantification of the *Striga hermonthica* life cycle processes as a basis for *Striga* seed bank management in West Africa
Shamie Zingore	Zimbabwe	PhD	Legumes and manure
Gertrude Tawodzera	Zimbabwe	BSc	Pigeonpea screening
Prudence Tambara	Zimbabwe	BSc	Cowpea fertilizer interactions
Zanele Nyama	Zimbabwe	BSc	Cowpeas
Junko Kojima	Japan	PhD	Behavior of P released from rock phosphate in soil under conventional upland farming practices
Comfort Mayame	Zimbabwe	PhD	Spatial modeling of regional soil water balance from remotely sensed data and indigenous knowledge to predict crop stress and mitigate food deficit in Niger

Workshops, Conferences and Training Courses during 2002

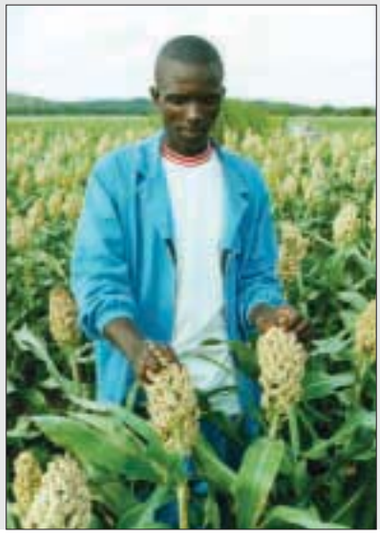
Event/Topic/Date	Location	Participants	Participating countries/institutes	Resources and collaborative support
Workshops/Meetings				
The 47th ordinary session and 20th ministerial session of the African Groundnut Council (AGC), 8-11 January	Kano, Nigeria	150	Nigeria, Niger, Senegal, The Gambia, Sudan	Government of Nigeria
APRLP Orientation Workshop, 11-12 February	ICRISAT-Patancheru	20	APRLP, Govt of AP, India	APRLP, ICRISAT
Strategic Marketing Workshop, 4-7 March	ICRISAT-Patancheru	25	India, Kenya, Mali, Mozambique, Niger, Nigeria, IWMI-India, The Conservation Company, USA, AddVenture Network, USA	ICRISAT
Aflatoxin workshop, 4-6 March	ICRISAT-Patancheru	40	India, United Kingdom	DFID-funded aflatoxin project
Tata-ICRISAT project launching and planning workshop, 26-27 March	ICRISAT-Patancheru	37	ICAR Institutions, BAIF, NRSA, Tata Trust, JNKVV, IWMI, ICRISAT, India	Tata, ICRISAT
Strengthening farmers' seed systems as a basis for enhancing productivity and profitability of sorghum in Mali. Options and recommendations from an interdisciplinary project, 29 March	Bamako, Mali	30	Point Sud, ICRISAT, IER, AOPP, CMDT, INERA, Burkina Faso	ICRISAT, PRGA
The 3rd steering committee meeting of the ICRISAT/NARS/IFAD project, 8-9 April	Bamako, Mali	30	7 countries	IFAD
Project planning workshop: *Améliorer l'accès à la diversité génétique à travers la sélection participative: Rôles des différents types d'organisations paysannes et des organismes de développement au Mali*, 13 April	Samanko, Mali.	25	GTZ/PACT, Point Sud, IER, SNV, AOPP	ICRISAT
Regional stakeholders' conference for priority setting on water and sustainable development in Africa, 15-17 April	Acccra, Ghana	200	African countries	–
Groundnut germplasm project for West Africa workshop, 22-25 April	Bamako, Mali	42	13 countries	CFC
Sorghum and millet experts meeting, 23-26 April	Bamako, Mali	60	ICRISAT, CIRAD, IRD, ECA (United Nations Economic Committee for Africa), IPGRI, INTSORMIL, CFC and local and international NGOs, apart from NARS scientists from Nigeria, Mali, Niger, Senegal and Burkina Faso	CFC



Event/Topic/Date	Location	Participants	Participating countries/institutes	Resources and collaborative support
The 3rd steering committee meeting of the ICRISAT/NARS/IFAD project, 8-9 April	Bamako, Mali	30	7 countries	IFAD
An annual in-house review meeting, 23-26 April	LCRI, Maiduguri, Nigeria	60	Nigeria	LCRI
Workshop on *Innovations in Innovation: Exploring partnerships and diversity in the generation, diffusion and use of new knowledge,* 6 May	ICRISAT-Patancheru	36	India	ICRISAT
Workshop on *Improving Income and Nutrition by incorporating mungbean in cereal fallows in the Indo-Gangetic plains of South Asia,* 23-25 May	ICRISAT-Patancheru	20	Bangladesh, India, Nepal	AVRDC
Diversité, Conservation et Valorisation des Ressources Génétiques des Mils, 28-29 May	TVC, Niamey	55	IRD-France, IRD-Niger, UPMC-Paris VI, ICRISAT-Niger, ICRISAT-Mali, INRAN-Niger, INERA-Burkina Faso, IER-Mali, Ambassade de France au Niger, European Union, Belgium Section of Cooperation, University of Niamey, ROCAFREMI, ILRI, IPGRI-Benin, NGOs, Government of Niger	IRD-France, UPMC-Paris VI-France, ICRISAT-Niger, INRAN-Niger
Stakeholders' Review and Project Planning Workshop of the DFID/PSRP-funded project on *Promotion of rainfed rabi cropping in rice fallows of India and Nepal: Pilot phase,* 28-30 May	ICRISAT-Patancheru	40	Bangladesh, India, Nepal, Taiwan and UK	DFID/PSRP
Holistic approach to heart disease, 11 May	ICRISAT-Patancheru	53	ICRISAT, INDIA	ICRISAT
International stakeholders' workshop for a challenge program on legumes and biological nitrogen fixation, 10-14 June	Montpellier, France	40	Bangladesh, Brazil, Egypt, Ethiopia, France, Germany, Ghana, India, Morocco, Philippines, Senegal, South Africa, USA, Vietnam, Zimbabwe, AVRDC, IITA, ICARDA, CIAT-TSBF, FAO, IAEA	IDRC, DFID
Farmer participatory improvement of grain legumes in rainfed Asia. First in-country planning meeting – India, 19-20 June	ICRISAT-Patancheru	13	India	IFAD
Tata-ICRISAT project-launching workshop on *Combating land degradation and increasing productivity in Madhya Pradesh*, 20 June	Bhopal, India	45	ICAR institutions, BAIF, Govt of Madhya Pradesh, JNKVV, Tata Trust, Samaj Pragathi, MSSRF, ICRISAT	Tata, ICRISAT, ICAR, BAIF

Event/Topic/Date	Location	Participants	Participating countries/institutes	Resources and collaborative support
Project Steering Committee (PSC) of CGIAR-CAC Initiative, 24-26 June	Tashkent, Uzbekistan	30	CAC-NARS (Kazakstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan in Central Asia; Armenia, Azerbaijan and Georgia in the Caucasus; CG Centers (CIMMYT, CIP, ICARDA, ICRISAT, IFPRI, ILRI, IPGRI, ISNAR, and IWMI), CGIAR Secretariat, the World Bank, the USAID and TACIS	CGIAR
First in-country planning meeting on *the International Fund for Agricultural Development Technical Assistance Grant (IFAD TAG)-532-ICRISAT – Farmers' participatory improvement of grain legumes in rainfed Asia*, 24-25 June	Kathmandu, Nepal	40	Nepal, India	IFAD
Workshop on *Targeting agricultural R&D in the SAT of sub-Saharan Africa*, 1-3 July	ICRISAT-Nairobi	50	ILRI, IWMI, ICRAF, ASARECA, CORAF, SACCAR, universities, private sector and others	ICRISAT, USAID
Tata-ICRISAT project-launching workshop on *Combating land degradation and increasing productivity in eastern Rajasthan*, 26 July	Jaipur, India	41	ICAR institutions, BAIF, Govt of Rajasthan, Tata Trust, MPUAT, MSSRF, NRSA, ICRISAT, India	Tata, ICRISAT, ICAR, BAIF
Workshop on *Integrated crop-livestock systems in the dry savannas of West Africa*, 25-27 July	IITA, Ibadan	40	Niger, Nigeria, Mali, Burkina Faso, Ghana	DANIDA
Pre-proposal drafting workshop for CGIAR challenge program on *Desertification, drought, poverty and agriculture – Building livelihoods and saving lands*, 4-8 August	Aleppo, Syria	40	Representatives from the UN Convention to Combat Desertification Global Mechanism (GM), the CCD-Committee for Science and Technology, UNEP-Global Environmental Facility Office, UNDP, NARS representing sub-regional networks and organizations of Africa and Asia, as well as Thematic Program Networks associated with the UNCCD, IUCN, the World Conservation Union, universities, six CGIAR centers and donor organizations, IFAD and IDRC	ICRISAT, ICARDA
Workshop on *Instructional design for open-distance learning on dryland agriculture*, 12-13 August	ICRISAT-Patancheru	17	India	ICRISAT, COL
Review and planning meeting for the convergence in APRLP watersheds, 19 August	ICRISAT-Patancheru	55	Dept of Agriculture, Govt of AP, APRLP, ICRISAT, India	APRLP, ICRISAT

Event/Topic/Date	Location	Participants	Participating countries/institutes	Resources and collaborative support
Workshop on *Techniques for identification of plant varieties*, 23 August	ICRISAT-Patancheru		India	ICRISAT
Working group meeting on *Combating pigeonpea sterility mosaic disease: A step towards sustainable pigeonpea production,* 2 September	ICRISAT-Patancheru	30	India, Nepal	DFID
ICRISAT/FAO workshop on *Sustaining agricultural productivity and enhancing livelihoods through optimization of crop and crop-associated biodiversity with emphasis on SAT agro-ecosystems,* 23-25 September	ICRISAT-Patancheru	40	Bangladesh, Brazil, Burkina Faso, China, France, India, Indonesia and Italy	ICRISAT, FAO
Workshops on *Improving the efficiency of seed need assessment in emergency situation,* 30 September-3 October	Maputo, Mozambique	15	Mozambique: DDA, SPA and NGOs	ICRISAT, INIA, DINA
Two-day workshop on *Plan of operations,* 26-27 September	Mangochi, Malawi	15	Malawi, Mozambique, Zambia and Zimbabwe	SADC, ICRISAT
International workshop on *Facilitating the improvement of pearl millet in West Africa through conventional and molecular plant breeding, farmers' participation and comparative genomics strategies,* 9-12 October	Bamako, Mali	60	Around the world	ICRISAT, Cornell University, Malian National Program and donor agencies
Workshops on *Improving the efficiency of seed need assessment in emergency situations,* 15-18 October	Gaza, Mozambique	24	Mozambique: DDA, SPA and NGOs	ICRISAT, INIA, DINA
Workshops on *Improving the efficiency of seed need assessment in emergency situations,* 22-25 October	Inhambane, Mozambique	21	Mozambique: DDA, SPA and NGOs	ICRISAT, INIA, DINA
Regional workshop on *System databases and simulation models as tools for soil and water management in ECA: Towards increased research efficiency and impact,* 28-30 October	ICRISAT-Nairobi	24	Nine member countries of ASARECA, (Burundi, DR Congo, Rwanda, Sudan, Tanzania and Eritrea, Kenya, Madagascar, Uganda), ICRISAT, ICRAF, CIAT, S Africa, Cornell University	SWMRG, SUA, NRSP, DFID, OSWM, ICRISAT
Regional workshop on *Soil and water conservation techniques and WOCAT data in Niger,* 28-31 October	Niamey, Niger	60	Niger, Burkina Faso, Mali, Tchad, WOCAT/Universite Catholique de Louvain, Univeristy of Hohenheim	WOCAT, ANCES, DED, ICRISAT
Workshop for project planning: *Développement de programme sur la recherche et la promotion des semences améliorées,* 29 October	Samanko, Mali	15	Enterprise Works Worldwide, ICRISAT, Afrique verte, IER and AOPP	ICRISAT, Enterprise Works-Mali

Event/Topic/Date	Location	Participants	Participating countries/Institutes	Resources and collaborative support
Final evaluation program of groundnut germplasm project, 31 October-11 November	ICRISAT-Niger, Mali, Senegal	15	INRAN, IER, ISRA, CORAF, CIRAD NGOs, Ministry of Agriculture	CFC
Launching meeting for the second phase of *Dates for the Sahel* project, 26-29 November	Niamey, Niger	12	INERA, Burkina Faso; IER, Mali; ISRA, Senegal; INRAN-Niger, ICRISAT	IDRC
Workshops on *Improving the efficiency of seed need assessment in emergency situation*, 11-14 November	Sofala, Mozambique	18	Mozambique: DDA, SPA and NGOs	ICRISAT, INIA, DINA
Workshops on *Improving the efficiency of seed need assessment in emergency situation*, 15-18 November	Manica, Mozambique	20	Mozambique: DDA, SPA and NGOs	ICRISAT, INIA, DINA
Workshops on *Improving the efficiency of seed need assessment in emergency situation*, 18-21 November	Tete, Mozambique	15	Mozambique: DDA, SPA and NGOs	ICRISAT, INIA, DINA
Workshop to *define strategies for the development of an effective and sustainable local seed production system*, 6-7 November	Luanda, Angola	50	IARC Consortium, IPGRI, ICRAF, ODI, SADC Seed Security Network	MINADER, IARCs, USAID
Brainstorming workshop on *Coping strategies for drought management*, 19-21 November	ICRISAT-Patancheru	60	ICAR institutions, JNKVV, BAIF, Tata-Trust, MPKV, NRSA, ANGRAU, APRLP, MSSRF, ICRISAT, India	Tata Trust, APRLP and ICRISAT
Stakeholders' meeting to form consortium of partners, 27-29 November	ICRISAT-Patancheru	50	ICRISAT, NARS, NGOs, private sectors, United Kingdom, government organizations, NDDB, farmers	DFID-funded aflatoxin project
Workshop on *A vision for rainfed agriculture in Asia: Targeting research for development*, 2-4 December	ICRISAT-Patancheru	50	India	ICRISAT and ICAR
Workshop on *Impact of seed trade liberalization on access to and exchange of agro-biodiversity*, 5-6 December	Matopos, Zimbabwe	13	ICRISAT, Michigan State University	FAO
International workshop on *Methods for assessing the impact of natural resource management research*, 6-7 December	ICRISAT-Patancheru	39	Sri Lanka, Norway, USA, India and ICRISAT	ICRISAT, NCAP
Strategic marketing workshop, 14-16 December	ICRISAT-Patancheru	25	Conservation Company, USA, AddVenture Network, USA, ICRISAT-Patancheru, Niamey, Nairobi, Bamako, Bulawayo	ICRISAT
Asian regional consultation on *Rural women in knowledge society*, 15-19 December	ICRISAT-Patancheru	42	Bangladesh, Cambodia, China, India, Republic of Korea, Malaysia, the Philippines, Sri Lanka, Thailand, and Vietnam	ICRISAT, FAO and Commonwealth of Learning
Review workshop on *Farmer field schools*, 19-20 December	ICRISAT-Bulawayo	70	FAO, CARE, ICRISAT, NGOs, farmers, area chiefs, staff from AREX	ICRISAT




Event/Topic/Date	Location	Participants	Participating countries/institutes	Resources and collaborative support
Training Courses				
Training course on *Methods for the detection of pigeonpea sterility mosaic virus and screening for SMD resistance,* 3-10 January	UAS, Bangalore, India	11	SCRI, UK, UAS-Bangalore, ICRISAT	DFID
An exposure visit of MLAs/MPs of Ranga Reddy and Medak districts on *Integrated Watershed Management,* 30 January	ICRISAT-Patancheru	30	Govt of Andhra Pradesh	Govt of AP
Training programs for farmers on *Integrated Watershed Management,* 25 February-7 April	ICRISAT-Patancheru	400	Andhra Pradesh, India	DPAP, AP, India
Initiation de l'union des organisations des producteurs de céréales de Dioila, 1 March	Dioila, Mali	40	Mali	PRGA, ICRISAT
Training course on *Farm machinery – operations & maintenance,* 1-28 April	ICRISAT-Patancheru	5	College of Agricultural Engineering, Raichur, Karnataka, India	ICRISAT
Restitution des résultats de recherche participative de sorgho en zone Vision Mondiale (2000 et 2001), 2-3 April	Bla, Mali	30	Mali	PRGA, ICRISAT
Vermicompost training for women, 4-15 April	ICRISAT-Patancheru	20	Andhra Pradesh, India	DWCRA, AP, India
Training course on *Configuring and running Century Model using Century Model Interface,* 8-10 April	NBSS & LUP, Nagpur, India	15	India	NATP, ICRISAT
Training program for farmers on *Integrated Watershed Management,* 16 April-9 May	ICRISAT-Patancheru	500	Andhra Pradesh, India	DPAP, AP, India
Restitution des résultats de recherche participative de sorgho en zone CMDT (de 1999 à 2001), 24 May	Koutiala, Mali	40	Mali	PRGA, ICRISAT
Training course on *Management of tillage on a research farm,* 27 May-5 June	ICRISAT-Patancheru	4	India	ICRISAT, ASK Group, Sponsors
Field layout for variety trials on farm, partners from village Wobougou, 27 May	Samanko, Mali	6	Mali	PRGA, ICRISAT
Training program on *Tropicultors,* 29 May	ICRISAT-Patancheru	375	Andhra Pradesh, India	DPAP, AP, India
Restitution des résultats de recherche participative avec les Organisations, AMCFE, ACOD et TONUS et initiation des agents techniques à l'analyse des résultats de l'évaluation variétale, 3 June	Samanko, Mali	15	Mali	PRGA, ICRISAT
Conducting variety trials with farmers for members of AOPP (Association des Organisations Paysannes Professionnelles), 11 June	Bamako, Mali	15	Mali	AOPP, ICRISAT
Training course on *Experimental techniques for field research in agriculture,* 8-13 July	ICRISAT-Patancheru	15	India	ICRISAT, ASK group, Sponsors
Training of agricultural officers in the *Identification of peanut stem necrosis and bud necrosis diseases,* 18-21 July	Kurnool, Cuddapah, Anantapur } India	78 130 110	Andhra Pradesh, India	NATP, ICRISAT

Event/Topic/Date	Location	Participants	Participating countries/institutes	Resources and collaborative support
Training in *AMG reservoir construction for builders,* 25-26 July	ICRISAT-Niamey	20	Four regions in Niger	Private Sector, World Bank
Training program on *Tropicultors*, 29 July	ICRISAT-Patancheru	25	Andhra Pradesh, India	DPAP, AP, India
Training in *Principles and operation of AMG*, 29 July-5 August	Agrhymet AMG Training Center, Niger	40	Seven regions in Niger	Ten NGOs, World Bank
Training course on *Experimental designs, management, analysis and report data,* 19-29 August	ICRISAT-Patancheru	8	India, Myanmar, Nepal	ICRISAT, ASK group, Sponsors
Training program for Agricultural Development Consultants (ADCs), 29-30 August	ICRISAT-Patancheru	15	Andhra Pradesh, India	Govt of AP, India
Training course on *Methods for the detection of pigeonpea sterility mosaic virus and screening for sterility mosaic disease resistance*, 29 August-6 September	ICRISAT-Patancheru	5	India, Nepal	ICRISAT, DFID
Conducting variety trials with farmers for Peace Corps Volunteers, 9-10 September	Samanko and Tubani So, Mali	25	Mali	Peace Corps, ICRISAT
Training course on *Pigeonpea improvement with special emphasis on CMS-based hybrid breeding technology*, 16-18 September	ICRISAT-Patancheru	11	India	ICRISAT, ASK group, Sponsors NGOs farmers organizations , World Bank
Farmers' training in *HNPV production and utilization*, 7 October	ICRISAT-Patancheru	4	Andhra Pradesh, India	IFAD, ICRISAT
Training course on *JoinMap3 Windows for linkage mapping*, 8 October	ICRISAT-Patancheru	12	India	ICRISAT
Regional training course on *Nursery methods and tree propagation techniques,* 21 October – 1 November	Niamey, Niger	32	Burkina Faso, Mali, Senegal, Niger, Bissau Guinea, Chad	Finlande, MASHAV, Jean Paul II Foundation
IPM training, 21 October	ICRISAT-Patancheru	3	Russia, Turkmenistan, Vietnam	ICRISAT
Training course on *GenStat Windows for experimental design and data analysis,* 31 October – 1 November	ICRISAT-Bulawayo	14	Zimbabwe	ICRISAT, SMIP
Farmers' training in *HNPV production,* 6-7 November	ICRISAT-Patancheru	4	Andhra Pradesh, India	ICRISAT, IFAD
Variety evaluations and panicle selections with farmer representatives from all regions, 6 November	Samanko, Mali	110	Mali	PRGA, ICRISAT
AMG reservoir construction for builders, 7-8 November	ICRISAT-Niamey	5	Niamey region	Private sector, World Bank
Training course on *Integrated Pest Management – nuclear polyhydrosis virus production*, 25-29 November	ICRISAT-Patancheru	11	India	ICRISAT, APRLP, TATA, ADB
Training course on *Information Management Using CDS/ISIS*, 25-30 November	ICRISAT-Patancheru	6	India, Gambia	ICRISAT, ASK group, Sponsors
Training course for PIAs in the area of *Integrated Pest Management Nuclear Polyhydrosis Virus Production,* 25-29 November	ICRISAT-Patancheru	11	Andhra Pradesh, India	APRLP, ICRISAT
Training for trainers in the area of seed storage treatments, 27 November	ICRISAT-Patancheru	15	Andhra Pradesh, India	APRLP, ICRISAT
Training course on *Hands-on training on Integrated Management of pigeonpea and chickpea pests and disease*, 3-6 December	ICRISAT-Patancheru	7	India	ICRISAT, RWC
Regional training course on *African Market Garden (AMG) combined with vegetable seed production*, 3-12 December	Niamey, Niger	25	Burkina Faso, Mali, Senegal, Niger, Bissau Guinea, Chad, Cape Vert, Mauritania	MASHAV, Jean Paul II Foundation

SATrends

ICRISAT's monthly e-newsletter

satrends-moderator@cgiar.org

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Our brief yet exciting monthly e-newsletter of progress and achievement.
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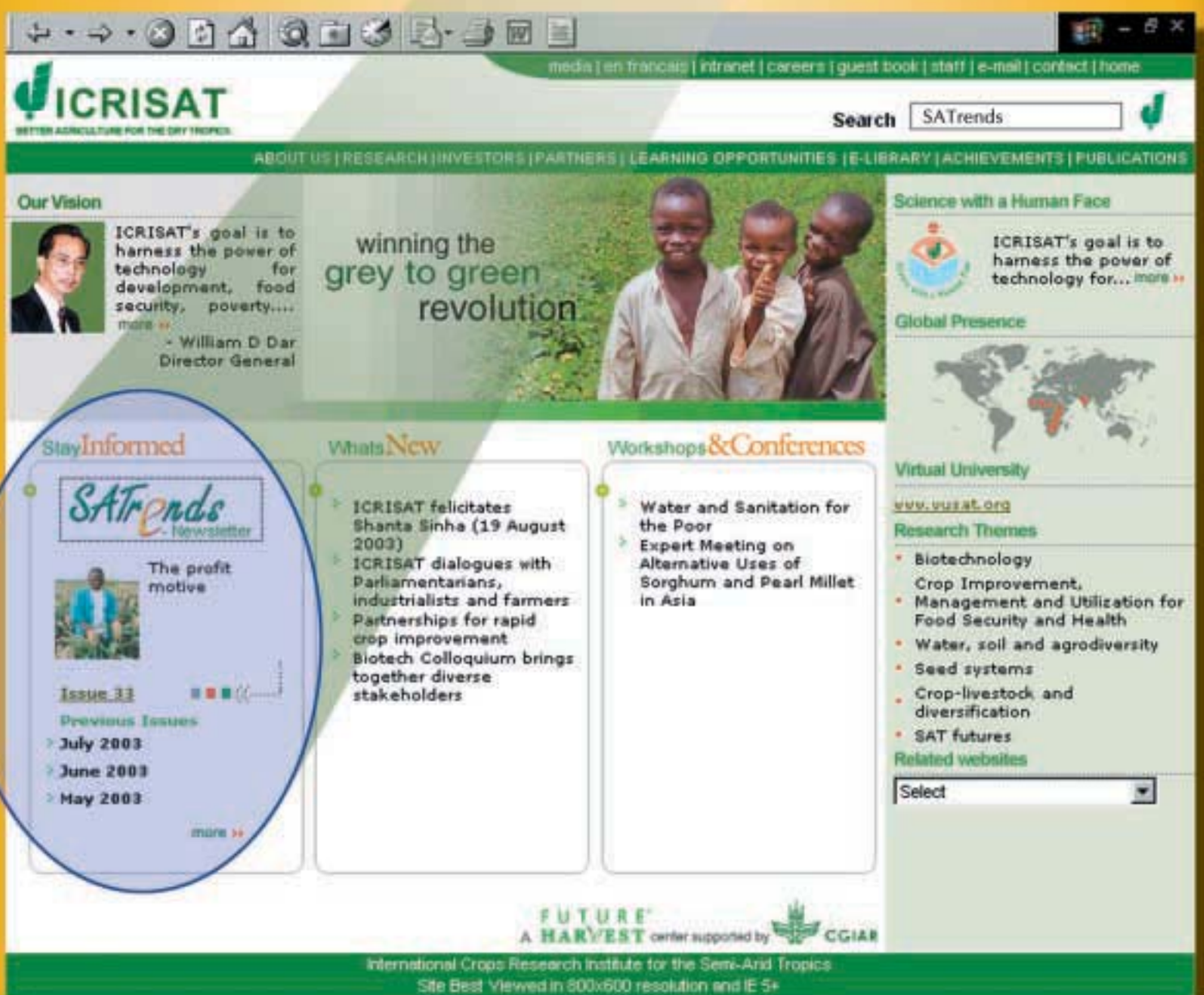

ICRISAT in

ICRISAT to sign MoU with Afghan ministry

Express News Service
Hyderabad, Jan 22

TO provide scientific support to recreate the country's agricultural system, destroyed by war and drought, the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) will be signing a Memorandum of Understanding (MoU) with the Afghan Ministry of Agriculture and Livestock.

According to a press release here, the decision was taken at a meeting between Afghanistan's First Deputy Minister of Agriculture Mohammed Sharif and ICRISAT senior officials durir the former's two-day visit to tl... institute.

The final MoU is expected to

పీదేశ్‌లో పూర్వవైభవం: ఆఫ్ఘన్ మంత్రి ఆశాభావం

హైదరాబాద్, జనవరి 21 (ఆంధ్రజ్యోతి): రాబోయే పదేళ్లలో అఫ్ఘనిస్తాన్ పూర్వ వైభవాన్ని సాధిస్తుందని ఆ దేశ వ్యవసాయ శాఖ మంత్రి మహమ్మద్ షరీఫ్ ఆశాభావం వ్యక్తం చేశారు. తమ దేశ పునర్నిర్మాణానికి ఇది చాలా సమయం పడుతుందని, గతించిన తొలి పాలనలో తాలిబన్ ప్రభుత్వం తమ ప్రయోజనాల కోసం అఫ్ఘనిస్తాన్‌లో రాజకీయాలను దేశవ్యాప్తంగా అమలు అన్నారు. నగర శివారులోని ఇక్రిశాట్ సందర్శన కోసం వచ్చిన ఆయన సోమవారం సాయంత్రం ఏతీర్థంలో మాట్లాడారు. యుద్ధానంతరం దేశం ఎంతో నష్టపోయిందని చెప్పారు. కనీసం ఎంతమంది ఇతికుల్కారో ఎంతమంది చనిపోయారో తెలియనంతగా విధ్వంసం జరిగిందని అన్నారు. ఒకప్పుడు ఇతర ఉత్పత్తుల్లో స్వయం సమృద్ధి ఉన్న తమ దేశం నేడు ఇతర దేశాలపై ఆధారపడాల్సి వస్తోందని ఆవేదన వ్యక్తం చేశారు. భారత నుంచి గోధుమలు, ఎరువులు దిగుమతి చేసుకునే విషయంలో పాకిస్తాన్ అభ్యంతరంపెట్టిందని, ఈ విషయంలో ఒక పరిష్కారాన్ని కనుగొనడానికి ప్రయత్నాలు జరుగుతున్నాయని చెప్పారు. యుద్ధానంతరం దేశ పునర్నిర్మాణానికి అంతర్జాతీయ సమాజం కింద అందిస్తున్న మొత్తంలో కొన్ని రోజులు మీగిలా జరగడంలేదన్నారు. ఇప్పటివరకు రష్యా విదుపర్లకు సహాయంలో ఎక్కువభాగం ప్రపంచ బ్యాంక్ గ్రూపులు, ఇతర ... వర్గాలకు సహా...

ఆ మీ... స్థా... మా... ఉన్న... రంగా... వల్ల ... అయి... స్థాని... రంగా... ప్రభుత్వ... అని ... ఉత్పత్తి ... అనగాహన ... ఇచ్చి రాష్ట్ర... మంత్రి మరి... డాక్టర్ ఫరీద్... షరీ... యోగ్యత... స్పెన్ ఎంతో ... మాదరి అంతర్...

Virtual lessons for dry land farmers

'Plan ahead for drought'

From Our Bureau

Hyderabad, Feb. 27: A virtual university will educate farmers in the semi-arid tropics of India, south Asia and sub-Saharan Africa.

The virtual university being initiated by Ismail and the M S Swaminathan Research Foundation, will be launched on World Environment Day on June 5. The Semi-Arid Tropics (SAT Virtual University) aims to develop climate, literacy and drought preparedness among rural communities. It will also disseminate information on climatic trends like monsoon behaviour and methods of drought management for community mobilisation.

Hyderabad, Feb. 27: Professor M S Swaminathan, eminent scientist and chairman of the Chennai-based M S Swaminathan Research Foundation, said governments have to be prepared to meet drought. "Though we have come a long way in tackling the menace of drought, I feel there is some complacency on this issue. There should be a component in the Budget itself," he said adding that governments should have contingency plans to meet situation like this. (Bureau)

ICRISAT gets $ 1-million endowment

Express News Service
Hyderabad, Oct 24

THE International Crops Research Institute for Semi-Arid Tropics (ICRISAT) today got a shot in the arm for its research on crops for poor farmers with an endowment of $1,000,000 from the SM Sehgal Foundation, a trust working in the area of village development.

The ...

ICRISAT partnershi...

... access to modern technologies, as enhancing their competence by decreasing the cost of production and increasing productivity is important to address problems like burgeoning population and poverty.

... provides opport... NARC a... basically pu... researches in le... since 1978. Pig... lentil, lathyrus...

नार्क र इक्रिस्याटबीच तीन कोसेबाली विकास गर्ने सम्झौता

■ संवाददाता सकाबदाता

काठमाडौं, मेक ४ । नेपाल कृषि अनुसन्धान परिषद (नार्क) र अन्तर्राष्ट्रिय अर्धशुष्क-उष्ण क्षेत्रीय खाली अनुसन्धान संस्था (इक्रिस्याट) बीच नेपालमा तीनवटा कोसेबाली विकास गर्ने सम्झौता भएको छ ।

सन् १९७७ देखि पोषणदुर्गम मिलेर चना, खुर्र र बदाम खालीको अध्ययन, अनुसन्धान र बेली विकास गर्ने क्रियाशील 'इक्रिस्याट' ले सन् २००२ देखि २००५ सम्म उक्त काम गर्ने सम्झौता गरेको परिषद्‌ले जनाए...

नेपालमा प्रायोजनी कार्यरत... जनता बाँधको राख्ने जानकारी दिँ... ह. विभिन्न खानेले उक्त बाँध... उपयुक्त जनता भाइको बाह्रउनुभयो लेखा उत्पादनको हिसाबमा चालीं = वर्ष २०५७/५८ मा १४ हजार १२ हजार १ मध्य ४८ मेट्रिकटन यसैगरी कोसेबालीका क्षेत्रफल तेसी भन्दामा पर्ने खर खात ३

अनुसार इक्रिस्याटको सहभागितामा उक्त बालीमा १ वर्ष २८ प्रतिशतले वृद्धि भएको छ ।

उनका, विभिन्न साग, मौसा, खोसेली र खलिका यसै ६ प्रकारका चनाको विकसित जात र राम्रापुर, फापरबारी खरकको विकसित जात सिफारिस भइसकेको छन् । यसैगरी एक वर्ष १० दिनमा पाक्ने भनाभको नयाँ जात पनि सिफारिस गरिएको छ । भाकाका कार्यकारी निर्देशक खानेसोडेको बात आर्थिक कमेना बाक वर्ष २१ करोड रुपैयाँ बनावरको विभिन्न जातका दाल विकासी भएको जानकारी दिँदै उक्त रकममा वृद्धि गर्न सकिने प्रसास

... अर्थ परिषदो डायरेक्टर रजाकारनी एवं सहयोग विभाग कार्यकलापहरु सम्बोधन

25 yrs of NARC, ICRISAT ties

Himalayan News Service
Kathmandu, May 16

Nepal Agricultural Research Council (NARC) and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) celebrated the Silver Jubilee of their partnership in research on leguminous crops such as chick pea and pigeon pea and oil-rich ... grasslands.

... Raghunath Sapkota and ... general William ... thening and Ca... (2002-2007) ... would focus on ... to agriculture ... augment pro... cial success sto... in the field of ... of partnership ... 2. These suc... er have provi... rt and partici...

('chana'), pigeon pea ('arahar') and groundnut ('badam').

Cultivation of such legumes has pumped new life into the rice-wheat system wherever in Nepal, said Sapkota. Agricultural production has substantially risen while also maintaining soil fertility.

Poor farmers who practise rainfed agriculture are the major producers of legumes. As Minister of Agriculture and Cooperatives Mahesh Acharya observed, this is because legumes are a cheap source of protein and thus they also help reverse land degradation.

Legume cultivation is important to support a 'clean' green revolution as they do not cause environmental problems like chemical fertilisers do.

Dr D S Pathe of ICRISAT said that NARC and ICRISAT together have a common mission of helping rural families to escape the vicious circle of poverty and malnutrition, with NARC striving to raise the standard of living of Nepali people and ICRISAT aiming to reduce poverty with science.

ARC of ...

Virtual varsity for ...

By Our Science Reporter
Hyderabad, Feb 27

INFORMATION Technology may no longer remain the privileged domain of elite sectors. Even a poor farmer in a remote village can receive IT benefits, thanks to the proposed Virtual University for Semi Arid Tropics (SAT-VU).

In a move that can go a long way in minimising losses due to drought conditions in several parts of the country, MS Swaminathan Research Foundation (MSSRF) and International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) will set up SAT-VU soon.

This was announced at a press conference at ICRISAT by chairman of MSSRF Prof MS Swaminathan and director-general of ICRISAT Dr William Dar today.

The main objective of the university,

बुधवार 19 मार्च 2003

व्यवसाय रंगंलो बयोटेक्नालजी ...

अफगानिस्तान के कृषि उप-मंत्री मो. शरीफ एवं इक्रिसेट के वैज्ञानिक फरीद खलिया संवाददाताओं से बातचीत करते हुए।

10 वर्षों में कृषि क्षेत्र में आत्मनिर्भर हो जाएगा अफगानिस्तान : शरीफ

... कृषि उप-मंत्री मो. शरीफ ने कहा कि पहले पाकिस्तान से अनाज ...

the News

THE HINDU, Thursday, January 23, 2003 17

SCIENCE & TECHNOLOGY

Alliance to tackle aflatoxin in groundnut

EFFECTIVE alliance of all takeholders including pol- y makers and officials, farmers, groundnut oil mill- processors and media should d to create more awareness in in groundnut.

mers, including farmers, be well informed about the l health risk of aflatoxin con- in in groundnut and related ditties.

were the key recommenda- stakeholders meeting to had a significant effect on the export of groundnut.

Globally, there is increased awareness and concern about the deleterious effects on health of aflatoxin and other mycotoxins, according to Dr. Farid Waliyar, Principal Scientist, ICRISAT.

However, within India there is little awareness of the potential risks to the health of aflatoxin.

The government officials and policy makers should also be made more sensitive to the issue of aflatoxin [illegible] to food and animal

Dr. Waliyar, Dr. Dyno Keatinge, Deputy Director General, ICRISAT, highlighted the potential risks posed by aflatoxin and spelt out ICRISAT's research strategies to manage this serious problem.

Dr. William D. Dar, Director-General of ICRISAT, in his opening [illegible] the need [illegible] ownership' [illegible]

Virtual varsity aid for drought

Newstoday

Hyderabad: The International crops research institute for semi-arid tropics (ICRISAT) and MS Swaminathan research foundation (MSSRF) are jointly launching a semi-arid tropics virtual university (SAT-VU) which aims at working with the existing drought action programmes.

Initially, the states of Andhra Pradesh, Karnataka, Maharashtra, Rajasthan and Madhya Pradesh would be covered by SAT-VU. The aim is to work towards increase in climate literacy and drought preparedness among rural communities, [illegible] servers, service

The university is expected to be inaugurated on World Environment Day (June 5). director-general of ICRISAT Dr William D Dar disclosed at a media conference on Thursday.

Dr William D Dar said by using information and communication technology (ICT) tools, SAT-VU would reach critical information to farmers and support them to tide over chronic drought.

The SAT-VU would network with the national open universities of India and Sri Lanka along with state open universities in Andhra Pradesh, Rajasthan and Maharashtra. A round-table conference among the representatives of these universities, the Indian council for agricultural research (ICAR) and the India meteorological department (IMD) was held during the day at ICRISAT to take steps to concretise the project.

A project at Adakkal village near Hyderabad piloted by ICRISAT is being built to draw experience for the grounding of SAT-VU. The project is empowering the villagers to cope with the prevailing drought through open distance learning.

Eminent agricultural scientist, Prof MS Swaminathan said SAT-VU was a novel initiative required to use modern science through the university to help the rural masses to tackle the 'emerging emergency' drought. To mitigate the effe of drought, there was an urge need for sustained informatio education and social mobili tion among the most vulnerab rural communities. This ta could be fulfilled by SAT-VU.

Prof Swaminathan said the virt al university was also likely t draw expertise available withi the country along with the Commonwealth, the International water management institute (IWMI) and other international development agencies. The lessons learn from India would be used to implement the Virtual university initative in Sub-Saharan Africa.

ip day observed

tunities as well. and ICRISAT are artnering into egume production geonpea, chickpea, s, horsegram and among the major f Nepal.

ng to the primary the current fiscal rops, cultivated in sand hectares is yield over 250 of the same and is put at 815 kg

oil crops, planted sand hectares, is duce over 134 nes with a 9 kg per hectare. ning trend of ion, largely d y mould (BG boxer, too w

today. To address the problem and rehabilitate the chickpea in the country a joint research including farmers as well was organised in 10 villages in 10 districts was carried out during the last fiscal year, speakers said on the occasion.

Disease resistant breed seed treatment through Rizobia culture, usage of 'DAP chemi fertilisers along with integra pest management experimensed during research. The outcome of research was much better th traditional methods of chi plantation. "In fact, the yiel the research was higher per cent than the usual speakers stated.

NEPAL, BANGLA TO IMPORT INDIAN FOOD CROP

Super chickpea by Icrisat

FROM OUR BUREAU

Hyderabad May 30: An improved variety of chickpea (ICCV 2) — developed by Icrisat and dubbed 'drought-loving' crop — is all set to grow in the rice fallows of Bangladesh and Nepal.

This follows the successfully cultivation of the chickpea variant in over 300,000 hectare in Andhra Pradesh. The positive impact and the constraints of growing chickpea as a second crop in rice fallows was discussed at an international workshop on 'Rabi Cropping in Fallows' held at Icrisat May 28-30 and f United Kingdom for Inter

ernmental agencies, besides Icrisat's scientists, vouched for chickpea as an answer to extended rice fallows as the plant is known to increase the productivity of soil. Chickpea requires maximum tillage, labour and costs, and is not dependent on irrigation. It is a dryland crop and gives additional income to the farmer.

The workshop discu feedback receive who grew Bangl

Bhattacharya from the Catholic Relief Services, M Yusuf Ali from the Bangladesh Agricultural Research Ins among others. Dav since the last f has been chick

Plan to develop ICRISAT as eco-tourism spot

Express News Service

Hyderabad, Jan 31

THE 3,500 acre campus of the International Crops Research nstitute for Semi-Arid Tropics CRISAT) at Patancheru may on become an agro-ecotourism ination.

ccording to Dr William Dear, ctor General of ICRISAT, a feasity study is under way to find of permitting nature lovers scenic environs of the cam- the feasibility study is posi- State Government will be ly contacted for its support loping activities on the This can add to the Gov- 's efforts in encouraging kinds of tourism packa State.

ISAT campus, with its nds, lakes, scrub jungles, nds, has always

ICRISAT - MALI. Organisation internationale de recherche agricole à but non lucratif et apolitique, fondée en 1972. l'Institut international de Recherche sur les Cultures des Zones Tropicales Semi-Arides (ICRISAT) œuvre pour l'amélioration bien-être des populations pauvres vivant dans les zones tropicales semi-arides à travers la recherche agricole pou développement. Pour mieux faire face à cette noble mission, l'ICRISAT vient de renforcer ses capacités.

ÉCONOMIE & FINANCES

Des chercheurs internationaux pour renforcer le dynamisme

semi arid tropics to come up soon

Chairman of MSSRF Prof MS Swaminathan and director-general of ICRISAT Dr William Dar addressing a news conference in the city on Thursday.

specific and trad drought condi made good pro ly, the bene the society through SAT

Totally d versity, SA by creatin the distr existing open un bodies Management in moswealth of Learning

The AP Government had decided to 1,000 information hubs in Mahaboobnagar district, he said.

A round-table discussion on the establishment of SAT-VU was organised by the two proponents today in which about 30 representatives from IGNOU, NRSA and the Government had participated. The modalities of the university would be finalised soon. The World Environmental Day June 5 - has been fixed as the tentative date

basis of participatory and demand-driven approach, he said.

Prof Swaminathan said the country had [illegible] data from 1000 and a treasure of local-

for the formal launch of SAT-VU.

గురువారం 23 జనవరి 2003

అఫ్గానిస్థానుకు ఐక్యరాజ్యసమితి స్నేహహస్తం

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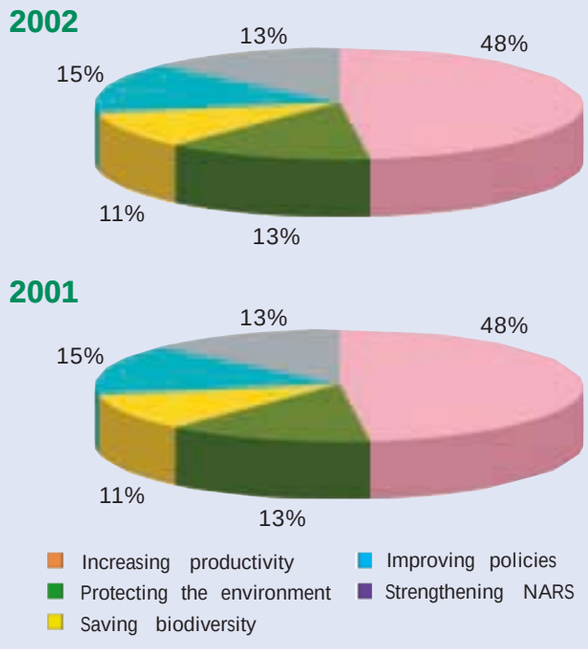
Financial Summary

Balance sheet

	$ '000	
	2002	**2001**
Assets		
Cash and cash equivalents	6,917	12,278
Investments	5,934	3,377
Accounts receivable	5,778	4,259
Inventories	711	776
Prepaid expenses	328	340
Property and equipment - net	6,584	7,604
Other assets	4,999	2,175
Total Assets	**31,251**	**30,809**
Liabilities		
Payments in advance from donors	5,598	3,462
Accounts payable	3,148	2,518
Accruals and provisions	979	1,183
In-trust funds	117	121
Long-term liabilities	6,907	5,986
Total Liabilities	**16,749**	**13,270**
Net Assets		
Unrestricted		
Unappropriated	3,021	3,485
Appropriated	9,477	14,054
Permanently restricted	2,004	-
Total Net Assets	**14,502**	**17,539**
Total Liabilities and Net Assets	**31,251**	**30,809**

Expenditures by CGIAR activity



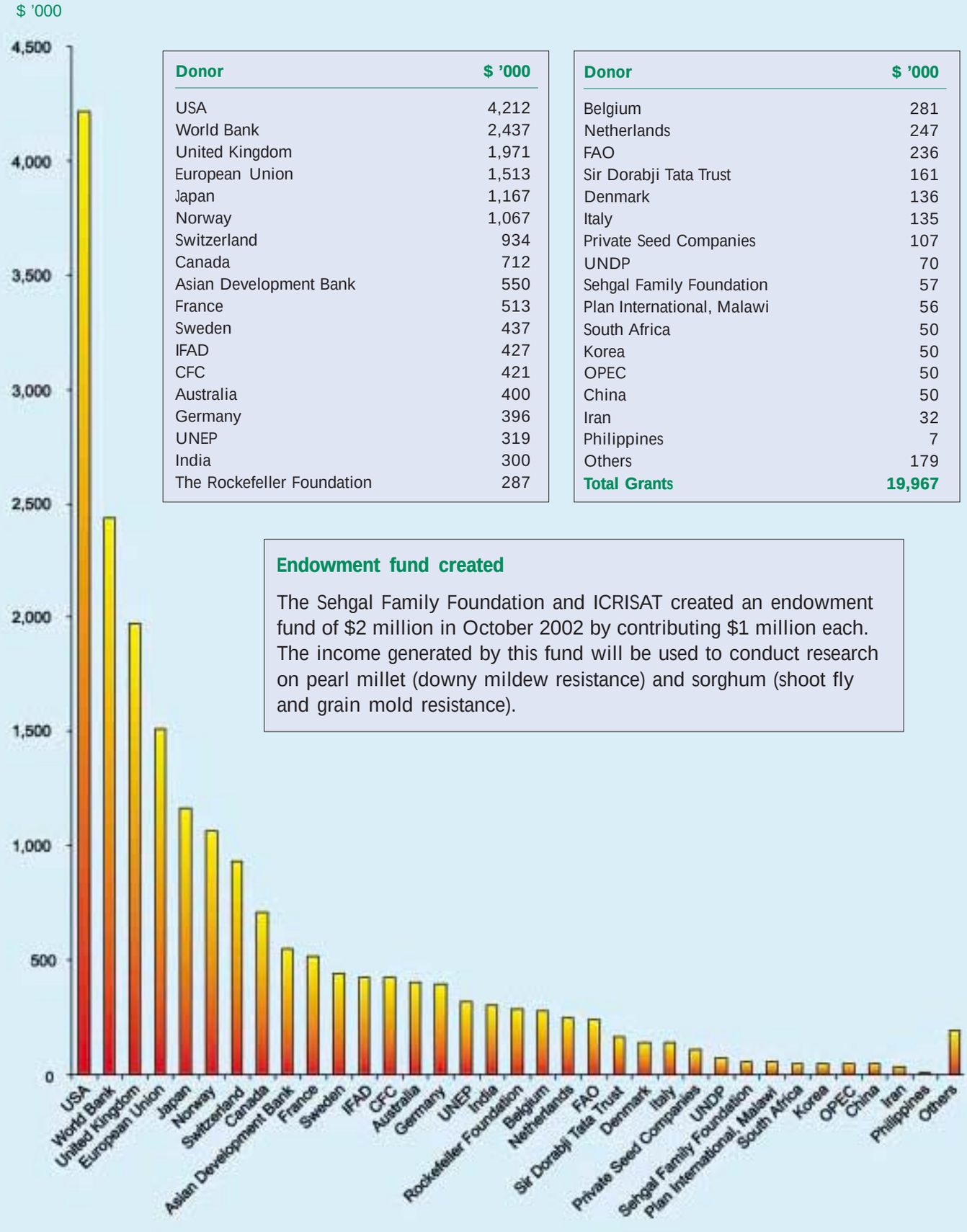
Operating results and movements in net assets

	($ '000)	
	2002	**2001**
Operating results		
Revenue	20,894	21,977
Expenditure	21,358	24,078
Change in net assets, operational	(464)	(2,101)
Extraordinary items	(3,538)	
Change in net assets, operational (net)	**(4,002)**	**(2,101)**
Net assets - unrestricted		
Unappropriated		
Balance, beginning of the year	3,485	5,137
Operating (deficit)/surplus for the year	(4,002)	(2,101)
Improvements to physical facilities	(66)	(255)
Transfer from appropriated net assets	66	255
Early retirement scheme	3,538	-
Changes in accounting policies		
Depreciation on assets in custody	-	121
Depreciation on buildings	-	328
Balance, end of the year	**3,021**	**3,485**
Appropriated		
Balance, beginning of the year	14,054	14,896
Changes in accounting policies		
Depreciation on assets in custody	-	(121)
Depreciation on buildings	-	(328)
Restricted projects assets	-	(137)
Transfer to unappropriated net assets	(66)	(255)
Housing loans, net of interest	27	3
Prior period charges	-	(4)
Early retirement scheme	(3,538)	-
Transfer to net assets - permanently restricted	(1,000)	-
Total net assets - unrestricted	**9,477**	**14,054**
Net assets - Permanently restricted	**2,004**	**-**
Total net assets	**14,502**	**17,539**

Grant income from donors for 2002

Donor	$ '000
USA	4,212
World Bank	2,437
United Kingdom	1,971
European Union	1,513
Japan	1,167
Norway	1,067
Switzerland	934
Canada	712
Asian Development Bank	550
France	513
Sweden	437
IFAD	427
CFC	421
Australia	400
Germany	396
UNEP	319
India	300
The Rockefeller Foundation	287

Donor	$ '000
Belgium	281
Netherlands	247
FAO	236
Sir Dorabji Tata Trust	161
Denmark	136
Italy	135
Private Seed Companies	107
UNDP	70
Sehgal Family Foundation	57
Plan International, Malawi	56
South Africa	50
Korea	50
OPEC	50
China	50
Iran	32
Philippines	7
Others	179
Total Grants	**19,967**



Endowment fund created

The Sehgal Family Foundation and ICRISAT created an endowment fund of $2 million in October 2002 by contributing $1 million each. The income generated by this fund will be used to conduct research on pearl millet (downy mildew resistance) and sorghum (shoot fly and grain mold resistance).

ICRISAT on the Web

Future Harvest Afghanistan
New Beginnings

ICRISAT's roadmap for a food secure SAT

William D. Dar
Director General

Managing common pool natural resources to improve livelihood security

William D Dar
Director General
ICRISAT

Alleviating poverty in the drylands:
integrated natural resource management

William D. Dar

The New Missionaries

William D. Dar
Director General

International Crops Research Institute for the Semi-Arid Tropics
(ICRISAT)

DR. WILLIAM D. DAR
DIRECTOR GENERAL

BNARS and ICRISAT:
Twenty Five Years of Successful Partnership in Enhancing the
Livelihoods of the Poor

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ICRISAT's Three Decades of Impact in the Semi-arid Tropics

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ICRISAT at
Dr. A.P.J. Abdul Kalam
Dr. C. Rangarajan
Shri N. Chandrababu Naidu

IFAD-ICRISAT: Improving legumes productivity for poor farmers in Asia

William D. Dar,
Director General

CGIAR

Who We Are:
The King Baudouin Award

Investment in ICRISAT benefit the poor

ICRISAT's vision is guided by a new vision and strategy, its core competencies and comparative advantages, its strategic analysis of opportunities in the semi-arid tropics, its agricultural research and institutional environment, and how all of these impact on the livelihoods of the poor.

Our vision

ICRISAT's vision to 2010 is improved well-being of the poor of the semi-arid tropics through agricultural research for impact.

Our mission

ICRISAT's mission is to help the poor of the semi-arid tropics through science with a human face and partnership-based research and to increase agricultural productivity and food security, reduce poverty, and protect the environment.

Our mandate

ICRISAT's mandate is to enhance the livelihoods of the poor in semi-arid farming systems through integrated genetic and natural resource management strategies. ICRISAT will make major food crops more productive, nutritious and affordable to the poor; diversify utilization options for staple food crops; develop tools and techniques to manage risk and more sustainably utilize the natural resource base; develop options to diversify income generation; and strengthen delivery systems to key clients. Partnership-based research for impact, gender sensitivity, capacity building and enhanced knowledge and technology flows are integral to this mandate.

ICRISAT's locations

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